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# CYCLONE/COAL TIMBER HARVEST PROJECT

November 1998

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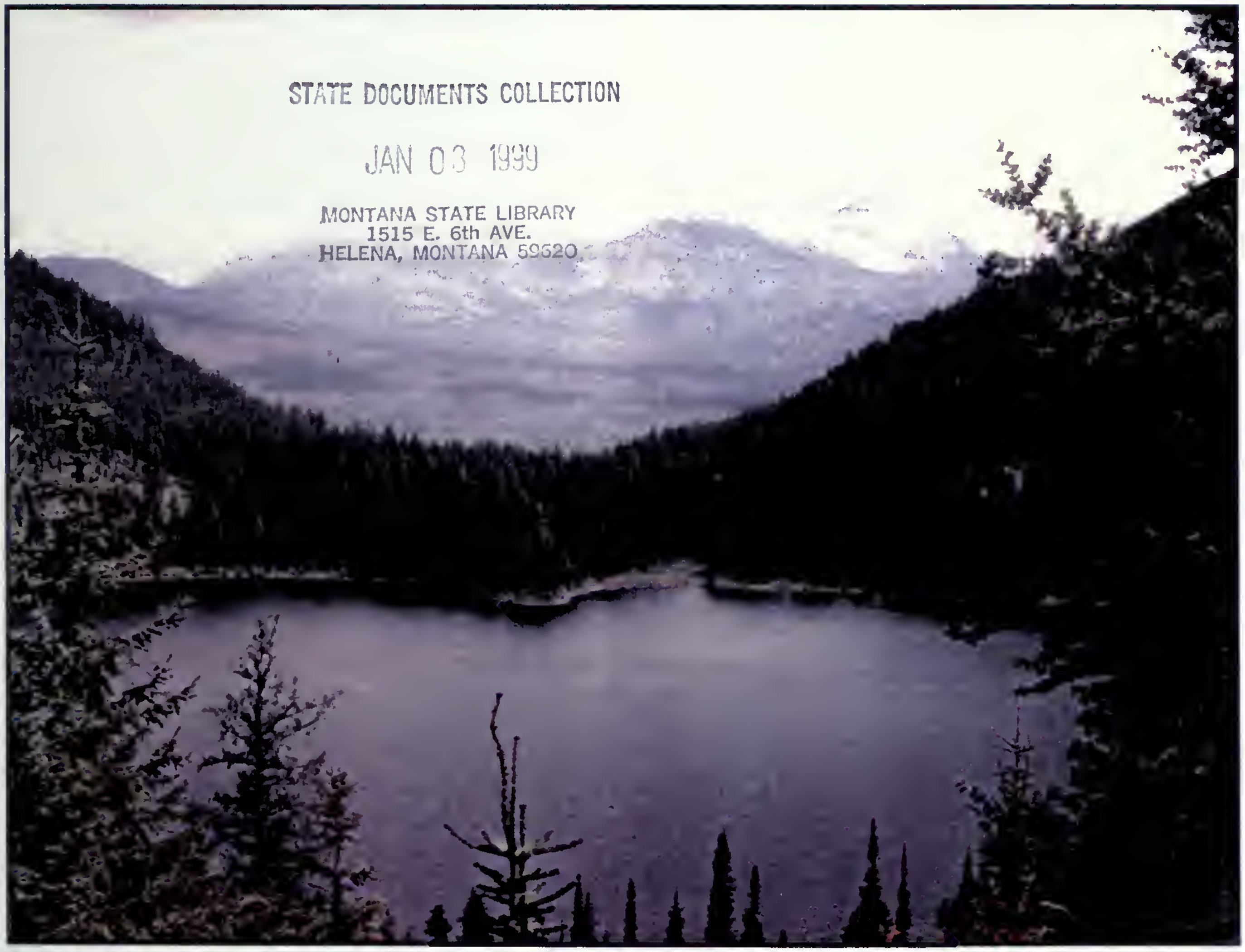

## Final Environmental Impact Statement

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# CYCLONE/COAL TIMBER HARVEST PROJECT

# DECISION REVIEW

August 11, 1999

The following document presents a review of the Cyclone/Coal Timber Harvest Decision by Robert L. Sandman, Stillwater Unit Manager, Department of Natural Resources and Conservation (DNRC).

The scope of the Decision Review is limited to actions associated with the Cyclone/Coal Timber Harvest Project. The Decision Review is site-specific and is neither a programmatic nor general management plan for Coal Creek State Forest, but is supplemental to the Decision Notice that adopted the proposed decision in the Final Environmental Impact Statement (FEIS).

## INTRODUCTION

An interdisciplinary team (ID Team) published the Draft Environmental Impact Statement (DEIS) for the Cyclone/Coal Timber Harvest Proposal on August 17, 1998; the FEIS was published on November 10, 1998. On November 27, 1998, a Decision Notice was published that adopted the proposed decision in the FEIS. The first timber sale was approved by the State Land Board on April 19, 1999, and sold to American Timber Company of Olney, Montana, on June 17, 1999. A third field tour was conducted with the Land Board staff, interested parties, and Nancy Keenan, a member of the Land Board on July 7, 1999. At the end of the field tour, I, Robert L. Sandman, agreed to reevaluate my decision and publish a Decision Review.

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## ALTERNATIVE SELECTED IN THE INITIAL DECISION

Six alternatives were developed and presented in the FEIS. Unit 5, the harvest unit of concern, was treated 4 different ways in these 6 alternatives:

- Alternative A, No-Action, included existing activities, but no timber sale.
- Alternatives B and D would have harvested approximately 3.002 million board feet (MMBF) from 200 acres by using a combination treatment of clearcut with reserves and seedtree with reserves.
- Alternative C and E would have harvested approximately 4.455 MMBF from 495 acres by using a combination treatment of thinning from below with some openings having seedtrees with reserves.
- Alternative F would have deferred timber management for 2 years (*DEIS, page II-3 through II-9*).

After the alternatives were analyzed, Department of Fish, Wildlife and Parks (DFWP) informed DNRC that funding from their sources would not be available for Alternative F. Therefore, Alternative F no longer met project objectives (*DEIS, page II-17*).

It was unlikely that Alternative A would move Coal Creek State Forest in a direction that complies with the philosophy of the State Forest Land Management Plan (SFLMP). It also did not provide adequate sawlog volume to contribute to DNRC's sustained yield as mandated by State

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Statute 77-5-222, Montana Codes Annotated (MCA) (*DEIS, page I-1*).

To varying degrees, the remaining 4 action alternatives met project objectives and could have been chosen.

I selected Alternative C with modifications.

I compared the modifications and specifications proposed for Alternative C to the analysis presented in the FEIS and concluded that the modifications and specifications were within the scope of the FEIS.

## DECISION REVIEW

For the following reasons, I have decided to remove all of the currently classified western larch/ Douglas-fir old-growth stands existing in Coal Creek State Forest from future timber sale harvesting consideration (618 acres). This will be in effect until DNRC can more accurately determine the appropriate distribution of attribute levels for old-growth western larch/Douglas-fir stands in Coal Creek State Forest. Salvage, except along open roads, will also be excluded.

- DNRC should systematically evaluate old-growth attribute levels. Future timber sale proposals will need to be analyzed by the old-growth index (currently being developed) or similar analysis tools to ensure that DNRC does not compromise its commitment to retain a full spectrum of forest conditions that would have been naturally present on the landscape.

- This is especially important for old-growth cover types that are currently below the desired amount, like western larch/ Douglas-fir.

- The retention commitment will protect the existing acres of western larch\Douglas-fir old-growth until an appropriate range of attribute levels can be determined.

For the following reasons, I have decided the initial decision to implement the Alternative C prescription in Unit 5 is still reasonable and acceptable:

- DNRC classifies Unit 5 as a mixed-conifer stand. Coal Creek State Forest has an overabundance of mixed-conifer stands at the expense of western larch/Douglas-fir stands. Although this will be reduced by harvesting Unit 5, Coal Creek will still have an overabundance of mixed-conifer stands at the expense of western/ larch/Douglas-fir stands.

- The Interdisciplinary (ID) Team was credible and labored to produce a project proposal and alternatives that reflected the philosophy of the recently adopted SFLMP. The ID Team considered the location of stands in relation to previous harvest units, the grizzly bear core area, and disease and insect infestation occurrences. Also considered were Cyclone Lake; accessibility; view sheds of concern; other wildlife concerns, such as connections/linkages and fragmentation; watershed issues; and old growth amounts and attribute levels. Based on these, certain stands were dropped from treatment consideration. For example, the Cyclone Lake area stands that had old-growth attribute levels (similar and/or higher than the South Coal area) were dropped. Connecting corridors of closed canopy forest over the Cyclone saddle that provide cover for wildlife security were dropped. Areas in the northern portions of Coal Creek State Forest were dropped due to previous harvest unit juxtaposition. Many acres were dropped to maintain the grizzly bear core area. Access and economic viability removed additional acres. The resulting harvest acres in the alternatives, including the proposal to harvest Unit 5, are consistent with the goals, objectives, and standards of the SFLMP.

- Project development complied with and exceeded MEPA requirements. Public involvement included, but was not limited to, open houses, newsletters, 3 field trips, and this Decision Review. The project incorporated public comments; the modified Alternative C still appears to best address all of the comments and issues that were submitted by the general public. In fact, Alternative C was developed in response to public input.

- The modified Alternative C will produce an estimated $1,961,260 return to the Trust and provide jobs and income for northwestern Montana. The second timber sale is not economically viable without harvesting one of the action alternatives for Unit 5, as described in the DEIS, Chapter II. It would not be appropriate, nor would it likely be covered by the EIS, to adopt a prescription that was not presented and analyzed in the EIS. Although implementation of either the prescription for Alternative B or C in Unit 5 would result in the second timber sale being economically viable, I still believe that it is a poor business decision to harvest healthy large-diameter larch given the current market condition. However, now is the time to harvest the understory, especially the subalpine fir. As noted on the field trip, these trees are still economically valuable as sawlogs, but will rapidly lose lumber value as they succumb to diseases and wood decay.

- The sale will contribute to DNRC's sustained yield, as mandated by State Statute 77-5-222, MCA.

- The rationale for the decision was logical, took into account public concerns, complied with the philosophy of the SFLMP, and will generate trust revenue while moving Coal Creek State Forest toward a desired condition. Realize that the rationale for the initial decision took into account more than just the scientific defensibility of each alternative. It also incorporated a landscape view, economics, statutory requirements, public comments, viability, current product markets, and environmental effects. I have spent much time on this project trying to understand a wide variety of viewpoints.

- I believe that none of the developed alternatives exactly emulate a natural wildland fire disturbance. For example, I seriously doubt that a stand-replacement wildland-fire event in South Coal would limit itself to 200 acres and the adjoining stands harvested in the 1980s as prescribed in Alternative B. I also believe there are more disturbance mechanisms at work on the landscape, such as blowdown, disease and insect infestations, avalanche activity, etc., than just wildland fires. Recognize that none of the alternatives were intended to be an exact replication of a wildland-fire disturbance and that emulation of a fire disturbance was not the only factor that helped shape the chosen prescription.

- I believe the prescription for Alternative C provides the most options for future treatment/ retention. If left alone after harvest, Unit 5 will recover many of its current attribute levels more rapidly than a regeneration harvest such as Alternative B. Unit 5 will still contain a viable overstory of mainly western larch that could be retained or entered with future treatments. The trees being retained are not only the most economically valuable, but are also of the age class that would take the longest to replace.

- During the Coal Creek Timber Harvest Project EIS process, DNRC changed its definition of old growth (FEIS Summary, page 19). Regardless of whether one prefers the initial old-stands definition, the current old-growth definition, or some other definition, the ultimate question is whether any type of harvesting in Unit 5 will result in less old growth than DNRC's commitment in the SFLMP. Coal Creek State Forest currently contains 2,277 acres of mixed-conifer stands that meet DNRC's minimum old-growth definition. DNRC's old-growth retention commitment for mixed-conifer stands in Coal Creek is 299 acres (DEIS, page III-2). Even if DNRC harvested all of the old-growth mixed-conifer stands in South Coal, Coal Creek would still exceed the mixed-conifer old-growth retention requirements. Discounting South Coal, there will remain at least 299 acres of mixed-conifer old-growth stands in Coal Creek with attribute levels that equal or exceed those currently in South Coal, such as the mixed-conifer stands adjacent to Cyclone Lake.

- After both timber sales are completed, the acres of western larch/Douglas-fir old growth, as defined by DNRC, will approximately double. Although it is unlikely that approximately half the western larch/Douglas-fir old growth should have the attribute levels like Units 2 and 5 will have immediately after harvest, they should recover high old-growth attribute levels sooner than the prescription in Alternative B. Remember that no classified old-growth western larch/Douglas-fir stands are being harvested by either timber sale (I dropped Unit 3 in the initial decision).

- DNRC is developing an old-growth index to help describe the attribute levels of old-growth stands. The index indicates that the stands in the South Coal area have index ratings indicating attribute levels are quite high. However, there are approximately 3,700 acres of old growth on Coal Creek State Forest with equivalent or higher old-growth index ratings. There are also approximately 570 acres of old growth that exceed the index ratings of the stands in the South Coal area.

## DECISION REVIEW OUTCOME

The 618 acres of existing old-growth western larch/Douglas-fir in Coal Creek State Forest will be retained until DNRC determines the appropriate distribution of attribute levels for the 50% retention commitment.

The second timber sale will be prepared and submitted to the State Land Board for approval. The exact date is not known, but I would anticipate it will be presented this winter or next spring.

## ADDITIONAL COMMENTS

- I will work with ID Teams to improve the level of understanding and readability of Stillwater State Forest environmental documents. Terminology, stand descriptions, prescriptions, objectives, etc., continue to be misunderstood.

- I want to encourage participation by those interested in the timber sale program at Stillwater Unit. Do not hesitate to contact the Stillwater State Forest Office to become involved.

- The suggestion made on the field trip to spray for orange hawkweed before the project occurs is an excellent idea. Stillwater is working with the Flathead County

Weed Department to accomplished this task.

- I believe the dialog about old-growth attribute levels needs to continue. However, I hope that forums other than individual timber sale projects will be created to promote the dialog at a broader level.

- I want to extend my sincere appreciation to everyone involved with this project. I have had many good discussions with people with different perspectives. Although my decisions may not be the ones you would have chosen, I believe they are in the best interest of the Trust. The management of State lands is better as a result of your interest.

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# SUMMARY

## FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE CYCLONE/COAL PROPOSED TIMBER SALE

### INTRODUCTION AND DESCRIPTION OF THE PROPOSED ACTION

The Department of Natural Resources and Conservation (DNRC), Stillwater Unit proposes to harvest timber in Coal Creek State Forest to generate revenue for the Montana School Trust. The project area is located approximately 2 miles south of Polebridge, Montana, and includes the entirety of 20 sections and portions of 9 sections in T34N, R21W, and T33N, R22W, for a total of approximately 15,060 acres (see Figure I-1 DEIS). If a harvest alternative is selected, 712 to 1,216 acres would be harvested with various silvicultural treatments.

### PROJECT NEED

In 1996, DNRC adopted and released the Record of Decision on the State Forest Land Management Plan (SFLMP). The State Board of Land Commissioners approved implementation of the SFLMP on June 17, 1996. The SFLMP outlines DNRC=s management philosophy for forested State trust lands and sets out specific Resource Management Standards for 10 resource categories. The SFLMP states:

> ***Our premise is that the best way to produce long-term income for the trust is to manage intensively for healthy and biologically diverse forests. Our understanding is that a diverse forest is a stable forest that will produce the most reliable and highest long-term revenue stream... In the foreseeable future, timber management will continue to be our primary source of revenue and our primary tool for achieving biodiversity objectives.***

The lands involved in this proposed project are held by the State of Montana in trust for the support of specific beneficiary institutions, such as public schools, *Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11*. The Board of Land Commissioners and DNRC are required by law to administer trust lands to produce the largest measure of reasonable and legitimate return over the long run for these beneficiary institutions, *Section 77-1-202, Montana Codes Annotated* (MCA).

### PROJECT OBJECTIVES

The Cyclone/Coal Timber Sale must produce the largest measure of reasonable and legitimate return to the trust in the long run. The sale would also provide a sufficient amount of sawlog volume to contribute to the sustained yield for DNRC as mandated by State Statute 77-5-222, MCA.

The project would move the forest toward the desired future conditions characterized by the proportion and distribution of forest types and structures historically present on the landscape.

### PROJECT AREA

The Cyclone/Coal proposed timber harvest area is located in Coal Creek State Forest, which is west of Glacier National Park, approximately .75 miles south of Polebridge, and 23 miles north of Columbia Falls (Figure I-2, page 5). The project area is located in the Cyclone and Coal watersheds and the State Coal Cyclone Grizzly Bear Management Subunit.

The project covers 15,060 acres and ranges in elevation from 3,710 feet, where Coal Creek leaves the project area, to the 6,766-foot Coal Ridge, located on the western boundary of Coal Creek State Forest. The project area consists of steep canyons, limited access, avalanche chutes, heavily timbered slopes, subalpine terrain, and riparian areas along Coal and Cyclone creeks and the small feeder streams. No major activity has occurred in the project area for the past 11 years.

The project is bordered on the north, south, and west by Flathead National Forest (FNF) lands. The eastern boundary is bordered by Glacier National Park, the North Fork of the Flathead River, and private lands. The project area is colored blue on USFS maps and marked as Coal Creek State Forest.

### *EIS DEVELOPMENT*

The EIS was prepared in compliance with the Montana Environmental Policy Act (MEPA). MEPA requires State government to include consideration of environmental impacts in its decisionmaking process. It also requires agencies to inform the public and other interested parties of the proposed projects, environmental impacts that might result, and alternative actions that could achieve project objectives.

### *PUBLIC CONCERNS*

The initial stage of an EIS is the public scoping process, which is used to inform the public that a State agency is proposing an action and gather comments on the possible impacts of the project. The scope of this EIS was determined by the professional judgement of resource specialists in DNRC and other State and Federal agencies and comments from the public and other interested parties.

DNRC solicited public participation in the Cyclone/Coal timber harvest project on January 10, 1997, by distributing a letter and the initial project proposal to individuals, landowners, organizations, industries, and agencies. As the project continued, interested parties were updated during open houses in April, 1997; a field tour on October 3, 1997; 4 newsletters at critical points during the development of the project that requested additional input from the public; and another field tour on October 6, 1998.

The project was advertised in Kalispell's Daily Interlake Newspaper and Columbia Falls' weekly Hungry Horse News. Comments on the project were accepted through December 31, 1997.

The mailing list of parties interested in the project is located in the project file. Public scoping comments are summarized in chapter II of the DEIS; the original comments are located in the project file at the Stillwater Unit Office, Olney.

### *CONCERNS RAISED DURING SCOPING*

Through the scoping process, concerns were raised by the public and specialists of DNRC and other agencies about the project's potential impacts on the environment. These concerns were used in developing the alternatives (see Chapter II). A summary of the comments that were incorporated into the alternatives is presented below.

## VEGETATION

### *ECOSYSTEM CHARACTERISTICS*

Concerns were raised that:

- Timber harvesting would reduce the total area of forest.
- Timber harvesting could alter the ecological characteristics of forested stands in the project area.
- Timber harvesting may reduce the structural and compositional diversities that stands require to function as natural ecosystems.
- Existing stands may be fragmented.
- Edge effects may increase beyond levels acceptable for the maintenance of natural biological diversity.
- Coal Creek State Forest is lacking in early successional forests.
- Seral or intolerant cover types are not represented in proper proportions in the landscape that would historically be expected.
- There is a loss of western white pine on the landscape due to white pine blister rust.
- Fire hazard is extreme due to the amount of dead and down woody debris on the forest floor caused by stagnant lodgpeole pine stands.

### OLD GROWTH

Concerns were raised that:

- The character of old-growth stands in the project area might be significantly altered, and the connections of those stands with adjacent old-growth stands could be affected.
- Timber harvesting may ruin the opportunity to use existing old-growth stands as Anatural areas@ where the ecological uniqueness of old-growth forests could be maintained.
- The amount, distribution, connectivity, and character of the old-growth timber stands in Coal Creek State Forest may be changed by the harvesting within them.
- A lack of development and implementation by DNRC for a long-term, old-growth management strategy exists.
- Old-growth-dependent species may become locally extinct.
- All existing old growth should be maintained due to the lack of a long-range plan for the old-growth stands in Coal Creek State Forest.

### TIMBER VALUE

Concerns were raised that:

- Timber sales would no longer support school trusts if the cost of preparation outweighs the returns to the trusts.
- Timber stands should be managed to provide for long-term health and productivity.

- Timber harvesting should be done so the full diversity of structural components, genetic variation, and species mix is maintained in these stands.

## WILDLIFE

Cumulative impacts, including past, present, and antcipated future effects, to threatened and endanagered, old-growth-associated, sensitive, cavity-dependent, and big game species was a concern.

#### GRIZZLY BEAR (THREATENED SPECIES)

Concerns were raised that:

- Road densities would increase.
- Bears could be displaced from seasonal habitats.
- Travel corridors could be disrupted.
- Core or security areas could be reduced

#### OLD-GROWTH-ASSOCIATED SPECIES

Concerns were raised that old-growth blocks of sufficient size to support these species, with corridors between, would not be retained.

#### CAVITY-DEPENDENT WILDLIFE

Concerns were raised that:

- Useable snags of suitable size and species would not be retained.
- Allowance would not be made for the replacement of existing snags over time.
- The populations of cavity-dependent wildlife species would be reduced in the project area.

#### BIG GAME

Concerns were raised that:

- Timber harvesting could harm elk and white-tailed deer populations.
- Tree removal may reduce the availability of hiding and thermal cover.
- Road construction and improvement may reduce security by increasing the vulnerability of white-tailed deer and elk to hunters.
- Harvesting timber in moist sites could ruin moose and elk habitat.

#### BALD EAGLE AND COMMON LOON HABITATS

Concerns were raised that:

- Bald eagles and common loons would be displaced from their seasonal habitats and security areas.

- The flight patterns of eagles and common loons would be disturbed.

GRAY WOLF (THREATENED SPECIES)

Concerns were raised that wolves would be displaced from their seasonal habitats and security areas.

FISHERIES

Concerns were raised that bull and westslope cuthroat trouts may be harmed if water quality is adversely affected in the Cyclone and Coal drainages.

## WATER QUALITY

Concern was expressed that timber harvesting or road construction may add sediment and increase runoff to the Cyclone and Coal drainages, causing adverse effects to water quality and fisheries habitat.

## SOIL

Concern was expressed that timber harvesting might cause soil rutting, compaction, displacement, and loss of productivity.

## NOXIOUS WEEDS

Concerns were raised that:

- Weeds have increased rapidly on school trust lands, in particular, where timber harvesting has taken place.
- Weeds would be introduced and spread where timber harvesing is proposed.

## ALTERNATIVE MANAGEMENT

Concerns were raised that:

- Management guidelines for resources other than timber, described in the SFLMP, were compromised due to the expected volume needed from State trust lands and, specifically, Coal Creek State Forest.
- Because of this compromise, biodiversity would not be maximized.
- A cooperative agreement lease should be used emphasizing other resource needs that would reimburse the State trusts for any money loss due to the change of management criteria. A 2-year deferral will be analyzed as an alternative for this project.

## CULTURAL RESOURCES

Concerns were raised that timber harvesting might cause irreparable harm to any historical or archaeological resources in the project area.

A DNRC archaeologist examined the project area for historical or archaeological resources, but found none. Mitigating measures would be implemented if archaeological resources were found during further examination or during project activities (see Appendix B, Stipulations and Specifications, under Archaeology).

## LAND EXCHANGE

Concerns were raised that due to the sensitive nature of Coal Creek State Forest, DNRC management opportunities are limited. Therefore, Coal Creek State Forest should be exchanged for other lands that may be more suitable to the DNRC timber-management program.

## DEVELOPMENT OF ALTERNATIVES

An interdisciplinary team (ID team) was formed to work on the project. The role of the ID team was to develop the project and analyze potential impacts on the human and natural environment. The development of alternatives began in January, 1997, when DNRC developed a project proposal describing the proposed action and project time line. The proposal was sent to interested members of the public, adjacent landowners, and other State and Federal agencies for review. Comments were accepted for a 30-day period. Newsletters were sent out during important stages of the project to keep interested parties informed. Input was requested throughout the life of the project.

The ID team reviewed comments received and used them to develop 4 timber-harvesting alternatives, a deferral-type alternative, and a no-action alternative.

## *DESCRIPTION OF ALTERNATIVES*

### ACTIONS COMMON TO ALL ALTERNATIVES

The following actions would be implemented under all the alternatives:

- Ensure seasonal closure of the road leading to Cyclone Lake during nesting seasons for eagles and loons (winter and spring months).
- Due to structural failure and the potential for sediment entering Coal Creek, replace the Dead Horse Bridge that crosses Coal Creek.
- Bring roads that are under a cooperative agreement with USFS up to BMP standards.
- Treat noxious weeds in accordance with the Flathead County Weed Plan.
- Cooperatively with MDFWP, build, erect, and periodically maintain a floating sign regarding loon nesting and nursery areas.
- Erect and maintain a gate and signs indicating only nonmotorized recreational traffic is allowed on the trail leading toward Cyclone Lake.

### NO-ACTION ALTERNATIVE - ALTERNATIVE A

If Alternative A, the No-Action Alternative, were selected, none of the action alternatives would be implemented. Current management activities, such as fire suppression and road maintenance, would continue. The Dead Horse Bridge would be replaced. The natural progression of cover types toward more shade-tolerant species, such as subalpine fir and spruce, would continue. Following the appropriate level of MEPA review, other land management activities, such as timber harvesting, could be proposed and undertaken in the future. **Figure II-1** shows the project area as it would continue to exist under Alternative A. The No-Action Alternative can be used as a baseline for comparing the environmental consequences of the 4 timber-harvesting alternatives and is considered a viable alternative for selection.

### TIMBER-HARVESTING ALTERNATIVES - ALTERNATIVES B THROUGH E

The ID Team developed timber-harvesting alternatives based on an analysis of forest stand conditions. Proposed treatments would move the forest toward desired future conditions on the landscape. Three primary concepts were used to differentiate between alternatives:

- The western larch/Douglas-fir and western white pine cover types were determined to be the most underrepresented cover types on Coal Creek State Forest. Each action alternative would increase the proportion of the western larch/Douglas-fir and western white pine cover types, but in a different way.
- The large contiguous blocks of old growth were determined to be important components of the landscape on the Coal Creek State Forest. Each action alternative would affect the old-growth blocks in a different way.
- There is potential for establishment of a natural area in the future due to the distinctive resource qualities of portions of Coal Creek State Forest. The alternatives address these areas in different ways.

### ALTERNATIVES B AND D

Alternative B would harvest approximately 10.6 million board feet (MMBF) from 931 acres in 7 units. Alternative D is the same as Alternative B, except that Unit 1 is excluded. Alternative D would harvest approximately 9.8 MMBF from 699 acres in 6 units (see **Figure II-3, page 12**). Under Alternative B and D approximately .25 mile of new road may be built to access Section 14.

Alternatives B and D increase the proportions of the western larch/Douglas-fir and western white pine cover types by replacing existing mixed-conifer stands with regenerated young western larch/Douglas-fir and western white pine stands. This approach would limit the old growth entered by a concentrated harvest on a limited number of acres. Connectivity between old-growth stands would be maintained by not entering connecting stands.

Alternative D is the same as Alternative B, except that it incorporates the concern that was expressed during alternative development regarding the distinctive qualities (bald eagle nest, common loon nest, and grizzly bear core area) found in the Cyclone Lake drainage. Unit 1 is within the basin and visible from Cyclone Lake and other areas. By not harvesting in Unit 1, the potential to be designated as a Anatural area@ would be maintained in the future.

*Treatment of Unit 1 (Alternative B)-* Approximately 35% of Unit 1 would receive the seedtree with reserves treatment; the remaining 65% would have a shelterwood treatment. This unit was selected for this treatment due to the mortality occurring on this southwesterly slope from root rot fungus (*Armillaria*, spp.) The treatment acknowledges the long-term presence of root rots; thus, rather than eradicating root rots, the natural mortality is being salvaged. Over the long term, some gain in genetic resistance may be achieved through the harvest prescription, but root rot will probably always be present at some level. Due to ponderosa pine=s greater resistance to root rots, the planting of ponderosa pine is expected to reduce the long-term mortality in this unit.

### TABLE II-1 - ALTERNATIVES B AND D UNIT TREATMENTS

| UNIT # | TOTAL ACRES | TREATMENT | HARVEST METHOD | HARVEST VOLUME (MBF) | HAZARD REDUCTION/SITE PREPARATION | REGENERATION |
|---|---|---|---|---|---|---|
| *Unit 1 applies to Alternative B only:* | | | | | | |
| 1 | 232 | STR/SH | Helicopter | 810 | Broadcast-jackpot burn/hand scalp | Plant ponderosa pine |
| *Units 2 through 7 apply to both Alternatives B and D:* | | | | | | |
| 2 | 218 | CCR/SH | Soft track/ tractor | 5,232 | Broadcast-jackpot burn | Plant western white pine and western larch |
| 3 | 36 | CCR/STR | Tractor | 324 | Machine pile and scarify | Plant ponderosa pine and western larch |
| 4 | 21 | STR/SH | Tractor | 168 | Machine pile and scarify | Plant western white pine and western larch |
| 5 | 200 | CCR/SH | Cable, helicopter, and soft track | 3,002 | Broadcast/jackpot burn and machine pile | Plant western white pine and western larch |
| 6 | 62 | STR | Tractor | 310 | Machine pile and scarify | Plant western white pine and western larch |
| 7 | 162 | CCR | Tractor | 805 | Broadcast/jackpot burn | Natural |
| Alternative B Totals | 931 | | | 10,651 | | |
| Alternative D Totals | 699 | | | 9,841 | | |

STR - seedtree with reserves CCR - clearcut with reserves
STR/SH - seedtree with reserves with some areas of additional shelterwood retention
CCR/SH - clearcut with reserves with some areas of additional shelterwood retention
CCR/STR - clearcut with reserves with some areas of additional seedtree with reserves

## ALTERNATIVES C AND E

Alternative C would harvest approximately 9.5 MMBF from 1,226 acres in 7 units. Alternative E is the same as Alternative C, except Unit 1 is excluded. Alternative E would harvest approximately 8.9 MMBF from 994 acres in 6 units (see **Figure II-4, page 15**). Under Alternative C and E approximately .25 mile of new road may be built to access Section 14.

Alternatives C and E increase the proportions of the western larch/Douglas-fir and western white pine cover types by removing encroaching midlevel and understory mixed conifer trees in existing western larch/Douglas-fir and western white pine stands. This approach would enter old-growth stands, but retain large old trees, large snags, and concentrations of down woody material. Multiple canopy layers and associated old-growth attributes would redevelop as shade-tolerant species regenerate in the future. Connectivity between old-growth stands would be maintained by retaining these old-growth characteristics in the stands.

Alternative E is the same as Alternative C, except that it incorporates the concern expressed during alternative development regarding the distinctive qualities (bald eagle nest, common loon nest, and grizzly bear core area) found in the Cyclone Lake drainage. Unit 1 is within the basin and visible from Cyclone lake and other areas. By not harvesting in Unit 1, the potential for that area to be designated as a Anatural area@ would be maintained in the future.

*Treatment of Unit 1 (Alternative C)* - Approximately 25% of the unit would receive the seedtree with reserves treatment. The remaining 75% would receive a shelterwood treatment. Unit 1 was selected for this treatment because of the mortality occurring due to root rot fungus on this southwesterly slope. This treatment acknowledges the long-term presence of root rots; thus, rather than eradicating root rot, the natural mortality would be salvaged. Over the long term, some gain in genetic resistance may be achieved through our harvest prescription, but root rot will probably always be present at some level. No planting would occur in this unit; instead, the development of naturally resistant Douglas-fir would be relied upon.

## TABLE II-2- ALTERNATIVES C AND E UNIT TREATMENTS

| UNIT # | TOTAL ACRES | TREATMENT | HARVEST METHOD | HARVEST VOLUME (MBF) | HAZARD REDUCTION/SITE PREPARATION | REGENERATION |
|---|---|---|---|---|---|---|
| *Unit 1 applies to Alternative C only:* | | | | | | |
| 1 | 232 | STR/SH | Helicopter | 580 | Broadcast/ jackpot burn | Natural |
| *Units 2 through 7 apply to both Alternatives C and E:* | | | | | | |
| 2 | 218 | TFB/STR | Soft track/ tractor | 2,830 | Broadcast/ jackpot burn | Plant western white pine and western larch |
| 3 | 36 | CCR/STR | Tractor | 324 | Machine pile and scarify | Plant ponderosa pine and western larch |
| 4 | 21 | STR/SH | Tractor | 168 | Machine pile and scarify | Plant western white pine and western larch |
| 5 | 495 | TFB/STR | Cable, helicopter, and soft track | 4,455 | Broadcast/jackpot burn and machine pile | Plant western white pine and western larch |
| 6 | 62 | STR | Tractor | 310 | Machine pile and scarify | Plant western white pine and western larch |
| 7 | 162 | CCR | Tractor | 805 | Broadcast/jackpot burn | Natural |
| Alternative C Totals | 1,226 | | | 9,472 | | |
| Alternative E Totals | 994 | | | 8,892 | | |

STR - seedtree with reserves CCR - clearcut with reserves
TFB/STR - thinning from below with some openings having seedtrees with reserves
STR/SH - seedtree with reserves with some areas of additional shelterwood retention
CCR/SH - clearcut with reserves with some areas of additional shelterwood retention
CCR/STR - clearcut with reserves with some areas of additional seedtree with reserves

## DEFERRAL ALTERNATIVE - ALTERNATIVE F

Alternative F would defer timber management in the project area for 2 years, during which time a wider area of analysis in the North Fork of the Flathead drainage would be performed by Montana Department of Fish Wildlife & Parks (DFWP) and The Nature Conservancy (TNC) in conjunction with DNRC to determine and analyze the full range of resource values that exist on Coal Creek State Forest. During the two-year deferral, the trust would be compensated by the interested parties. Following the two-year deferral, several options would exist, including:

- entering into a cooperative private-public partnership to manage Coal Creek State Forest;
- to produce reasonable and legitimate income (including timber management),while giving preference to specific resource values;
- agreeing to defer or manipulate only certain areas of Coal Creek State Forest to meet agreed upon objectives;
- pursuing other forms of cooperative management; or
- returning exclusively to DNRC management.

## HOW TO ACCOMPLISH

A 2-step decision process would be needed to implement Alternative F. The initial decision would be to defer a timber-harvesting alternative in order to pursue the development of this proposed management strategy. If that decision is made, a second decision would be required to adopt or reject whatever proposals are developed during the 2-year planning period.

- Step 1 - This alternative would allow interested parties to purchase the right to jointly develop a management strategy over a 2-year period by deferring the proposed timber harvest. They would pay the expected amount of money to the trust that would be received if another action alternative was selected and the timber sold.

During the deferral period, the Nature Conservancy and DFWP would cooperate with DNRC to determine the resources to be managed, how they would be managed, and the comparison of the values generated from Alternative F as compared to managing strictly under the SFLMP. The Nature Conservancy, possible other interested parties, and/or DFWP would fund an analysis of a wider area to determine the value of the Coal Creek State Forest timber stands and the management strategies to be applied. For example, characteristics, such as old growth, that contribute to the overall natural life cycle of the forest located in the North Fork drainage, but differ from guidelines set by the SFLMP, would need to be designated for management by the State Land Board.

Since a cooperative management strategy may not use typical management practices on State forest land, DNRC would need to determine during the deferral period the methodology, responsibilities, and legal examples for this type of agreement. The agreement would develop a long-term partnership between DNRC and private individuals or organizations. DNRC would determine the amount of money lost to the trust using Alternative F compared to the management strategy found in the SFLMP. Alternative F would reimburse the trust for the difference, as well as fund other opportunities to manage the natural resources not stated in the SFLMP.

- Step 2 - Following the initial deferral period and acquiring the results of the wider analysis area, the second decision would be made. The results listed below, and others not thought of, could be adopted:

    - A long-term cooperative management agreement for the entire Coal Creek State Forest with the Nature Conservancy, DFWP, and, potentially, other entities.

    - Agreements that postpone or manipulate certain areas of Coal Creek State Forest to meet the Nature Conservancy or Hungry Horse Wildlife Mitigation Fund goals.

    - Recommendations for pursuing other

forms of cooperative management.

- Exclusive DNRC management. This may mean:
  - * implementing one of the timber-harvesting alternatives for this project;
  - * proposing new projects;
  - * adopting a different overall strategy based on the results of the analysis;
  - * meeting the cooperators= objectives under the SFLMP without additional management agreements and their associated costs;
  - * not reaching an agreement; or
  - * funding from the cooperators was lacking.

### STATUS OF ALTERNATIVE F

Since Alternative F was analyzed, DFWP informed DNRC that funding from their sources would not be available for implementation of this alternative, making DNRC unable to select this alternative. DFWP would still like to work with DNRC to cooperatively develop this alternative management philosophy in the future.

## PERMITS REQUIRED TO IMPLEMENT THE PROJECT

- A Stream Preservation Act Permit (124 Permit) is required from DFWP for activities that could affect any fisheries stream.
- A short-term exemption from Montana=s Surface Water Quality Standards (3A-Authorization) is required whenever activities introduce sediment above natural levels into live streams. This Department of Environmental Quality (DEQ) permit would be needed only if recommended by DFWP.

## SUMMARY OF ENVIRONMENTAL EFFECTS

The following table summarizes the environmental consequences of the alternatives. The scientific basis for the environmental effects summarized here is discussed in more detail in Chapter 4 of the Draft EIS.

## SUMMARY OF ENVIRONMENTAL EFFECTS

The following table summarizes the environmental consequences of the alternatives. The scientific basis for the environmental effects summarized here is discussed in more detail in Chapter 4 of the Draft EIS.

**TABLE II-3 - COMPARISON OF ENVIRONMENTAL EFFECTS BY ALTERNATIVE**

| RESOURCE | A | F | B | D | C | E |
|---|---|---|---|---|---|---|
| ***FOREST CONDITION*** | | | | | | |
| **Cover-type Representation** | Continued shift toward shade-tolerant species; movement away from appropriate condition. | | Increase shade-intolerant species; movement toward appropriate condition. | | Increase shade-intolerant species; movement toward appropriate condition. | |
| **Age-Class Distribution and Old-Growth Stands in Project Area** | Overall increase in old growth over time; movement away from appropriate conditions. | | Old growth reduced by 460 acres; movement toward appropriate condition. | | Old growth reduced by 42 acres; movement toward appropriate condition. | |
| **Post-harvest acres of old growth** | 5,306 acres | | 4,846 acres | | 5,264 acres | |
| **Old-growth Attributes** | Gradual increase in old growth attributes over time. | | None of the action alternatives greatly alter the old-growth characteristics of the total array of old growth remaining after the project. | | None of the action alternatives greatly alter the old-growth characteristics of the total array of old growth remaining after the project. Alternatives C and E move the proportion of remaining old-growth attributes in each category further from current conditions than do Alternatives B and D. | |
| **Increase in western larch/Douglas-fir cover type** | No development of replacement stands. | | Increase western larch/Douglas-fir cover type by 530 acres; movement toward appropriate condition | Increase western larch/Douglas-fir cover type by 504 acres; movement toward appropriate condition | Increase western larch/Douglas-fir cover type by 770 acres; movement toward appropriate condition | Increase western larch/Douglas-fir cover type by 744 acres; movement toward appropriate condition |

### TABLE II-3 - COMPARISON OF ENVIRONMENTAL EFFECTS BY ALTERNATIVE

| RESOURCE | A | F | B | D | C | E |
|---|---|---|---|---|---|---|
| **Stand Vigor** (lower # equates to higher vigor) | Shade-intolerant species crowded out; reduction in vigor over time (currently 2.42). | | Vigor increased to 2.33. | Vigor increased to 2.35. | Vigor increased to 2.38. | Vigor increased to 2.4. |
| **Patch size by cover type** | Increase in patch size over time. | | Decrease in patch size from current condition; maintain patch size in western larch/Douglas-fir. | | Decrease in patch size from current condition; increase in patch size in western larch/Douglas-fir. | |
| **Patch sizes of old growth in the project** | Increase in patch size of old growth over time; movement toward appropriate conditions. | | Decrease in average patch size of old growth by 75 acres; movement away from appropriate conditions. | | Maintain average patch size of old growth; movement toward appropriate conditions | |
| **Patch shape by cover type** | Minimal reduction in complexity of patch shape. | | | | | |
| **Patch shape by age class** | Decrease in complexity of patch shape; movement away from appropriate conditions. | | Minimal reduction in complexity of patch shape. | | | |
| ***T&E SPECIES (GRIZZLY BEAR)*** | | | | | | |
| **Open Roads** (% of entire subunit more than 1 mile per square mile) | Open roads would remain the same at 34.6%. | | | | | |
| **Open Roads** (% DNRC acres more than 1 mile per square mile) | 40.8% | | A range of increase from existing open-road densities of 32% to a decrease of 22%. | | | |
| **Total Roads** (% entire subunit more than 2 miles per square mile) | 30% | | No change for all action alternatives. | | | |

## TABLE II-3 - COMPARISON OF ENVIRONMENTAL EFFECTS BY ALTERNATIVE

| RESOURCE | A | F | B | D | C | E |
|---|---|---|---|---|---|---|
| **Total Roads (% DNRC acres more than 2 miles per square mile)** | 35.2% | | No change for all action alternatives. | | | |
| **Habitat values influenced by motor activities** | Spring - 100%<br>Summer - 100% Autumm - 100% | | A range of:<br>Spring - 118-80%<br>Summer - 121-82%<br>Autumn - 123-84%<br>(any percentage >100% would be a decrease in habitat value) | | | |
| **Core Area (DNRC acres)** | The Core Area will not change; presently is at 5,894 acres. | | | | | |
| **Hiding Cover (DNRC acres)** | Unchanged; gradual increase from the present 80% of Coal Creek State Forest. | | Reduce cover to 74%. | Reduce cover to 72%. | Reduce cover to 75%. | Reduce cover to 73%. |
| ***BIG GAME (ELK AND MULE DEER, WHITE TAIL DEER, MOOSE)*** | | | | | | |
| **Forage-dynamics effectiveness** | Little short-term change. | | Increase in summer forage abundance and availability. | | | |
| **Snow-intercept effectiveness** | Little short-term change. | | Reduction in snow intercept. | | | |
| **Direct human disturbance** | Little short-term change. | | No detrimental effects. | | | |
| ***BALD EAGLE*** | | | | | | |
| **Habitat condition** | No substantial changes in any alternative. | | | | | |

## TABLE II-3 - COMPARISON OF ENVIRONMENTAL EFFECTS BY ALTERNATIVE

| RESOURCE | A | F | B | D | C | E |
|---|---|---|---|---|---|---|
| **Nesting security** | No substantial changes. | | Small disturbance during latter portion of nesting. | Potential increase in risk of disturbance. | Small disturbance during latter portion of nesting. | Potential increase in risk of disturbance. |
| **Flight path** | No substantial changes. | | Small disturbance. | Potential increase. | Small disturbance. | Potential increase. |
| ***WOLF*** | | | | | | |
| **Habitat condition** | No discernible effects for all alternatives. | | | | | |
| **Effects to prey base** | Do not anticipate substantive changes in numbers, distribution, or habitat-use patterns of large ungulates, which are the wolf=s principle prey. | | | | | |
| **Security of denning/ rendezvous sites** | No discernible effects for all alternatives. | | | | | |
| ***AESTHETICS*** | | | | | | |
| **Characteris-tics of general landscape** | Change would continue due to natural processes; character of landscape would remain the same. | | View of large openings having scattered clumps of trees; visual quality would be affected. | | View of small openings that would mimic natural thinnings; visual quality would be affected to a lesser degree than Alternatives B and D. | |
| ***WATER QUALITY*** | | | | | | |
| **Annual runoff Cyclone Creek watershed** | 3% increase over natural runoff. (10% allowable increase) | | 4% increase over natural runoff. (10% allowable increase) | 3% increase over natural runoff. (10% allowable increase) | 4% increase over natural runoff. (10% allowable increase) | 3% increase over natural runoff. (10% allowable increase) |
| **Annual runoff Lower Coal Creek watershed** | 1% increase over natural runoff (10% allowable increase). | | 2% increase over natural runoff (10% allowable increase). | | | |

TABLE II-3 - COMPARISON OF ENVIRONMENTAL EFFECTS BY ALTERNATIVE

| RESOURCE | A | F | B | D | C | E |
|---|---|---|---|---|---|---|
| **Annual runoff South Fork of Coal Creek watershed** | 3% increase over natural runoff (10% allowable increase). | | | | | |
| **Harvesting within SMZs** | None for any alternative. | | | | | |
| **Existing sources of sediment that would be mitigated** | Replacement of Dead Horse Bridge. | | Replacement of Dead Horse Bridge; 1 mile of existing road rehabilitated; 36.6 miles bought to BMP standards. | | | |
| ***FISHERIES*** | | | | | | |
| **Impacts to fisheries habitat** | No change to fisheries from current condition. | | Low potential risk to fisheries habitat or population; continue to monitor fish habitat. | | | |
| ***AIR QUALITY*** | | | | | | |
| **Effects** | No change to existing air quality. | | Temporary reduction in air quality to a degree that would not exceed the levels defined by EPA, County, State, or local standards. | | | |
| ***SOILS*** | | | | | | |
| **Soil erosion potential from road system** | Erosion potential may increase on existing road system. | | Decrease erosion potential by implementing mitigations. | | | |
| **Soil impacts: displacement and compaction** | No change in existing compaction of the area in old skid trails and landings. | | Mitigation would limit impacts to about 5% of the harvested acres; approximately 38 acres would be affected. | | | |

## TABLE II-3 - COMPARISON OF ENVIRONMENTAL EFFECTS BY ALTERNATIVE

| RESOURCE | A | F | B | D | C | E |
|---|---|---|---|---|---|---|
| *SENSITIVE SPECIES* | | | | | | |
| **Black-backed Woodpeckers** | No improvement or degradation to habitat for all alternatives. | | | | | |
| **Common Loons** | No improvement or degradation to habitat. | | Small disturbance during latter portion of nesting. | No improvement or degradation to habitat. | Small disturbance during latter portion of nesting. | No improvement or degradation to habitat. |
| **Harlequin Ducks** | No improvement or degradation to habitat for all alternatives. | | | | | |
| **Boreal Owls** | No improvement or degradation to habitat. | | Detrimental to existing boreal owl habitat. | | Possibly some detriment to existing boreal owl habitat. | |
| **Pileated Woodpecker** | In the short term, maintain high-quality habitat; in the long term, decrease the habitat quality and quantity. | | In the short term, reduce quality of habitat; in the long term, potential abundance of habitat. | | Unclear; maintaining large larch trees would, potentially, maintain quality habitat; openings created may be detrimental to nesting habitat. | |
| **Northern bog lemming** | No change to all alternatives. | | | | | |
| **Fisher** | Habitat would improve incrementally. | | Some reduction of the overall quality of habitat. | | | |
| **Lynx** | In short term, little change of existing habitat; in long term, gradual reduction to habitat quality. | | Denning habitat would be reduced; foraging habitat would be reduced in the short term and increased in the long term; connectivity between foraging and denning elements would be reduced. | | | |

## TABLE II-3 - COMPARISON OF ENVIRONMENTAL EFFECTS BY ALTERNATIVE

| RESOURCE | A | F | B | D | C | E |
|---|---|---|---|---|---|---|
| *NATURAL AREA* | | | | | | |
| **Impacts to potential natural areas** | No degradation or improvement to areas having the potential qualities to become designated as a natural area. | No degradation or improvement to areas having the potential qualities to become designated as a natural area; may, potentially, resolve some of the natural area questions. | Reduce slightly the potential for a natural area designation. | No degradation or improvement to areas having the potential qualities to become designated as a natural area. | Reduce slightly the potential for a natural area designatinn. | No degradation or improvement ot areas having the potential qualities to become designated as a natural area. |
| ECONOMICS | | | | | | |
| Development Cost ($/MBF) | Total cost $200,000 to $350,000 (Funded from FI account) | | $32.21 | $34.98 | $37.30 | $39.76 |
| Total timber $ value based on estimated stumpage value, FI cost, and development cost time estimated harvest volume. | ($200,000 to $350,000) | | $3,949,900 | $3,691,670 | $2,793,615 | $2,702,866 |
| Total timber $ returned to the trust. | $0 | | $3,095,656 | $2,877,338 | $2,008,150 | $1,944,319 |
| Estimated deferral income | $0 | $139,667 | $0 | | | |

## DRAFT EIS (DEIS)

Following scoping, a DEIS was prepared, incorporating public comments relating to the issues that could affect the project. Immediately upon publication, in August 1998, the DEIS was circulated to everyone known to be interested. Comments were accepted for 30 days, and letters were received from the following groups/individuals:

Montana Wilderness Association
Friends of the Wild Swan
Confluence Timber Company
Coalition for Canyon Preservation, Inc.
Mike Justice
Montana Wood Products Association
Stoltze Land & Lumber Co.
Glacier National Park
Ronald Buentemeier
Steve Thompson

## FINAL EIS (FEIS)

In accordance with the Administrative Rules of Montana (ARM) 36.2.530, DNRC has decided to adopt the DEIS as the FEIS, with all corrections, responses to comments, and additional information found in the Cyclone/Coal FEIS errata. All issues raised by the public were either addressed in the DEIS, the responses to comments, or in the additional information that has been provided as part of the FEIS errata; thus, DNRC felt that it was unnecessary to reproduce a full FEIS. In an effort to be fiscally responsible, DNRC was able to reduce reproduction costs by approximately $1,000.

The comment letters received from the draft EIS and DNRC's responses are included in this Final EIS errata. No substantial changes were made to the analysis contained in the DEIS. However, several editorial changes and corrections were made and are outlined in the FEIS errata. Listed below is a summary of the most notable changes:

- Figure III-18 (Old-growth map) and the Soils Map (p. B-3) were reprinted so that they are more legible.

- Cumulative impacts of the proposed action and other concurrent actions were displayed more clearly in the FEIS errata, so that they are more evident to the reader.

- The definition of old growth in the glossary was simplified to more closely resemble our previous definition of old stands. Members of the public were confused by the distinction between old growth and old stands. So in an effort to clarify our old growth analysis procedures, we have since stopped using the term old stands when describing our current stand level inventory (SLI). This change in definition had no impact on the vegetation/old-growth analysis.

## PROPOSED DECISION

In the ARM 36.2.531(5), a final EIS must include: the agency's recommendation, preferred alternative, or proposed decision together with an explanation of the reasons therefor. Since the decision maker identified a combination/modification of the alternatives by which to implement the proposed action, he has chosen to write a proposed decision instead of identifying one singular preferred alternative. After comparing the modifications and specifications proposed for Alternative C to the analysis presented in the FEIS, we have concluded that the modifications and specifications are within the scope of the FEIS.

This portion of the FEIS presents the proposed decision by Robert L. Sandman, Stillwater Unit Manager, DNRC:

The scope of the proposed decision is limited to actions associated with the Cyclone/Coal Timber Harvest Project Proposal. The proposed decision is site-specific, and is neither programmatic nor a general management plan for Coal Creek State Forest.

An interdisciplinary team (ID Team) has completed the Draft Environmental Impact Statement (DEIS), and prepared the Final Environmental Impact Statement (FEIS) for the Cyclone/Coal Timber Harvest Proposal. After a thorough review of the DEIS, project file, public correspondence, corrections and additions made by

DNRC that were reflected in this FEIS, Department policies, standards and guidelines, and the State Forest Land Management Plan (SFLMP), Mr. Sandman proposes the following decision.

## 1. PROPOSED ALTERNATIVE SELECTION

Six alternatives were developed and are presented in the FEIS:

- Alternative A, the No-Action Alternative - includes existing activities, but does not include a timber sale;
- Alternative B harvests approximately 10.6 million board feet (MMBF) from 931 acres in 7 units;
- Alternative C harvests approximately 9.5 MMBF from 1,226 acres in 7 units;
- Alternative D harvests approximately 9.8 MMBF from 699 acres in 6 units;
- Alternative E harvests approximately 8.9 MMBF from 994 acres in 6 units; and,
- Alternative F defers timber management for 2 years (*DEIS, page II-3 through II-9*).

After the alternatives were analyzed, Department of Fish, Wildlife, and Parks (DFWP) informed DNRC that funding from their sources would not be available for Alternative F. Therefore, Alternative F no longer meets project objectives (*DEIS, page II-17*).

Alternative A would not immediately affect cover types. However, without treatment or disturbance, cover types would continue to shift toward shade-intolerant species and away from the desired future conditions (*DEIS, page IV-1*). Because fire suppression activities would continue, it is unlikely that natural disturbances by fire would occur similar to historic proportions. Therefore, it is unlikely that Alternative A would move Coal Creek State Forest in a direction that complies with the philosophy of the SFLMP.

To varying degrees, the remaining 4 action alternatives meet project objectives and could be chosen.

The proposed decision is to select Alternative C with the following modifications and specifications:

A. Unit 3 would be dropped from harvest consideration.

B. The proposed treatments for Unit 1 would not be implemented as described for Alternative C. Instead, the proposed treatments listed for Unit 1 would be implemented as described for Alternative B (harvest approximately 810 MBF from 232 acres, plant ponderosa pine).

C. No harvesting activities would occur in the South Coal area (Unit 5) during a year that mechanized activities are taking place on access roads to Section 14 (Unit 2).

D. The harvest units would be sold in two contracts. The first contract would harvest units 2, 4, 5, 6, and 7, totaling 4,113 MBF, from 463 acres, starting in 1999. The second contract would harvest units 1 and 5, totaling 5,265 MBF, from 727 acres, starting in 2000.

E. Spur Road should be used to access Unit 2 instead of Hay Creek Road. The Hay Creek Road could be used if the number of trips complies with the appropriate DNRC grizzly bear guidelines.

F. All gates shown on the "Road-Segment Closure" Map would be installed with the following implementation plan:

- Road segments A and B would be restricted in the spring to protect the road surface from damage. As soon as the road surface is firm enough to allow unrestricted use, the closure would be opened.

- Road segment C would be restricted year-round each year.

- Road segment B would be restricted year-round during the years that motorized activities required in Unit 2 exceed the number of trips allowed by DNRC grizzly bear guidelines.

- Road segment D would be restricted from November 15 to July 1 of each year.

G. The only option for motorized access to unit 2 may be the Hay Creek Road. If this happens, and the number of trips must exceed DNRC grizzly bear guidelines, then all four road segments (A, B, C, and D) would be restricted each year that motorized activity occurs in unit 2.

H. The stipulations and specifications listed in Appendix A of the DEIS would be implemented.

I have compared the modifications and specifications proposed for Alternative C to the analysis presented in the FEIS, and have concluded that the modifications and specifications are within the scope of the FEIS.

The rationale for this decision is presented in item 4.

## 2. RELATIONSHIP OF THE OBJECTIVES TO THE PROPOSED DECISION

A. Return To The Trust - The modified Alternative C would produce an estimated $1,961,260 return to the trust. Although the short-term revenue of the modified Alternative C is lower than either Alternatives B or D, the long-term revenue potential is higher given:

- the difference in the potential timber value remaining after harvesting in Units 2 and 5,
- the increased conversion of mixed conifer and subalpine types to western larch/Douglas-fir, and
- future treatment/retention options that this alternative provides.

B. Biodiversity - Alternative C appears to best meet the most vegetative-related objectives, particularly converting stands of mixed conifer back to old-growth western larch/Douglas-fir cover types, having minimum effects on overall stand structure, improving vigor, not changing age-class distribution, and maintaining the largest old-growth shape sizes.

## 3. RELATIONSHIP OF THE ISSUES AND PUBLIC COMMENT TO THE PROPOSED DECISION

A. Forest Conditions *(DEIS pages III-1 through 26 and IV-1 through IV-18)*

Acres harvested by the modified Alternative C by cover type are alpine fir, 230; Douglas-fir, 183; lodgepole pine, 179; mixed conifer, 520; western larch/Douglas-fir, 28; and western white pine, 50. Postharvest cover type acres within harvested units are alpine fir, 0; Douglas-fir, 183; lodgepole pine, 159; mixed conifer, 0; western larch/Douglas-fir, 834; and western white pine, 50. The alternative increases the western larch/Douglas-fir cover by 770 acres.

The modified Alternative C reduces old-growth stands by 6 acres to 5,300 acres, which is more than twice as many acres required by the SFLMP commitment of 2,142 acres. Harvest treatments would result in 931 acres of stands still being considered as old growth post harvest. The modified Alternative C slightly changes the age-class distribution.

The old-growth attributes remaining after harvesting the modified Alternative C would be:

- 2,597 acres with many large, live trees; 2,173 acres with some large, live trees; 424 acres with few large, live trees; and, 53 acres with no large, live trees (live trees more than 21 inches in diameter).
- 901 acres with many snags; 2,915 acres with some snags; 954 acres with few snags; and, 530 acres with no snags.
- 1,007 with much coarse, woody debris; 159 acres with some coarse, woody debris; 1,855 with little coarse, woody debris; and. 2,279 coarse, woody debris. The acres do not reflect abundance of debris, rather a comparison to the other alternatives.

- 3,498 acres with some decadence; 1,537 acres with little decadence; and, 265 acres with no decadence.

  Vigor would improve from a rating of 2.42 to 2.38.

  The modified Alternative C has a pronounced effect on increasing the vigor of old-growth stands, increasing multistory proportions, and decreasing 2-storied old-growth stands. However, the modified Alternative C would not produce a substantial shift in the character of the overall remaining old growth. The modified Alternative C reduces old-growth patch size by approximately 4 acres to 250.9 acres mean patch size. Mean age-class patch size would be reduced from 126 acres to 124.7 acres.

B. Noxious weeds (*DEIS, pages III 26 and IV-19 through 20)*

Spotted knapweed is the dominant noxious weed along open roads in Coal Creek State Forest. Equipment would be cleaned prior to entering the project area. Use of the herbicide, Tordon, is not extensive, nor is it being applied to sensitive areas. Herbicide use is strictly controlled through Environmental Protection Agency (EPA) requirements. Herbicide application would adhere to Montana Best Management Practices (BMPs) and the herbicides specific label guidelines. Any 'no-spray' areas would be designated on the ground before application to prevent detrimental effects to some aquatic species. These actions would prevent extensive or severe noxious-weed infestation or spread.

C. Soil (*DEIS, pages III 26 through 27 and IV-21 through IV-22)*

The area of soils affected would be limited to less than 15% of the total harvest unit area. Existing skid trails would be used to avoid cumulative impacts to soils, and mitigation measures would be implemented to comply with BMPs and maintain long-term soil productivity.

D. Natural Area (*DEIS, pages III-27 through 28 and IV-23 through 24)*

The modified Alternative C would harvest approximately 232 acres on the west slope of Winona Ridge. No new roads would be built and the harvest prescription involves dispersed partial cutting, thus preserving a largely natural appearance. In the short term, the modified Alternative C has the potential to slightly reduce the option for a future natural area designation in or around Cyclone Basin, or at least reduce the geographic scope.

E. Wildlife (*DEIS, pages III-29 through 47 and IV-24 through 43)*

1) Coarse-filter Assessment

Modifications of forest types resulting from implementing the modified Alternative C move the forest toward an appropriate condition, which should, generally, have a positive effect on the habitat features available for wildlife. The DEIS, pages IV-24 through IV-25, note areas that were considered for timber harvesting, such as stands that surround Cyclone Lake, but were rejected; keeping these areas in their current condition was deemed more important for reasons of ecosystem integrity related to wildlife.

Cover type, stand age, and patch characteristics postharvest would not appear to substantially differ from the mosaics that probably typified Coal Creek State Forest before effective fire suppression.

Given older forest stands on adjacent lands are currently below the range of naturally occurring variations in old forests, a reduction in acreage of older forests, although within historic proportions, would negatively affect species associated with older undisturbed forests.

2) Fine-filter Assessment

It was an impossible and unnecessary task to assess the existing status of, or evaluate the effects of, the proposed actions on all wildlife species and for specific habitats in the project area for the modified Alternative C. However, to ensure that the important habitat elements for wildlife species were sufficiently analyzed, wildlife Federally listed as threatened or endangered, species listed as sensitive by DNRC, and species managed as big game by DFWP were addressed.

a) Peregrine falcon

Impacts would be temporary and minor with no effect on peregrine falcon populations.

b) Bald eagle

Restricting motorized access to Cyclone Lake from November 15 to July 1 each year would benefit nesting eagles. None of the activities associated with the modified Alternative C involve timber harvesting or mechanized activity in either of the nest site areas, primary-use site areas, or potential nesting habitat zones. The entrance to the trail from Road 4A would be gated and posted. This may help decrease unlawful motorized access to Cyclone Lake. No helicopter flights to harvest Unit 1 would be allowed before August 1 to avoid disturbing nesting eagles, and timing restrictions on helicopter flights of the Cyclone lake outlet would be included in the timber sale contract.

c) Wolf

No discernible effect on wolves is anticipated given the stipulations and specifications in Appendix A.

d) Grizzly bear

Four specific indices were used to assess effects to grizzly bears.

- Road Density - No total road density increase would occur. The road restrictions presented as specifications for modified Alternative C would result in a 7% decrease in open-road density when motorized activities are required in Unit 2, and a 1% decrease when motorized activities are required in Unit 5. If Hay Creek Road is needed for more trips than allowed by guidance, there would be a 0% increase/decrease in open-road density for unit 2.

- Security habitats (referred to as Core Areas) would be maintained at current levels, totaling 5,894 acres.

- Seasonal indices for grizzly bear habitat, as a result of prescribed road restrictions, would improve spring habitat by 4%; would result in a no-net loss for summer habitat; and would result in a habitat improvement of 1% in autumn when mechanized activities are required in Unit 2. When mechanized activities are required in Unit 5, the prescribed restrictions would result in a 6% increase in spring habitat value; an 8% decrease in summer; and a 6% decrease in fall. If Hay Creek Road is needed for more trips than allowed by guidance, the prescribed restrictions would result in a 1% increase in spring habitat value; a 4% increase in summer; and a 7% increase in fall.

- Hiding cover would be reduced from the current 80% to 72%.

In summary, the modified Alternative C results in a slight decrease in open-road density, a slight increase in spring habitat values, and slight increases or decreases in summer and autumn habitat values, depending on the locations of mechanized activities, and hiding cover would be reduced to 72%. Overall, the modified Alternative C meets and exceeds current DNRC grizzly bear guidelines.

e) Common loon

Prescribed road restrictions, gating the entrance to the trail that accesses Cyclone Lake, and placing an informative floating sign on Cyclone Lake near the loon brood-rearing area should offset the effects of harvesting Unit 1. In the long term, they should also produce a net benefit to nesting common loons by potentially decreasing human activity on Cyclone Lake.

f) Harlequin duck

Harlequin ducks would not be affected by this action.

g) Boreal owl

The effect of the modified Alternative C is not clear. However, it has been suggested that some kinds of thinnings, like that prescribed for Unit 5, can be consistent with managing for boreal owls.

h) Black-backed woodpeckers

Indirectly, the modified Alternative C reduces the potential for nesting capability from its current potential by reducing the risk of stand-replacement fires. However, a number of recent large fire events in the North Fork are providing available habitat.

i) Pileated woodpecker

Effects of modified Alternative C are not clear. Overstory trees would remain in place; however, thinning from below may reduce habitat suitability.

j) Northern bog lemming

No effects are anticipated.

k) Fisher

The modified Alternative C would reduce the overall habitat quality for fisher by removing near-ground structures that fishers prefer in harvest units. However, all harvest units provide buffers on either side of streams and adequate travel corridors would remain. Thus, substantial effects are not anticipated.

l) Lynx

The modified Alternative C would reduce forage quality in the short term, but would likely produce a high-quality forage environment within a few decades. Travel habitat would be retained. Denning structures within harvest units would be reduced, but this would not produce a large or insurmountable barrier across the landscape.

m) Big game

No detrimental effects are anticipated for big game.

F. Watershed (*DEIS, pages III-47 through 50 and IV-43 through 50)*

The effects of the modified Alternative C may create a short-term increase in sedimentation, but prescribed activities would lead to a long-term net benefit to water quality by eliminating several existing sources of sediment.

A 4% increase in water yield is anticipated for Cyclone Creek, a 2% increase for Lower Coal Creek, and a 3% increase for the South Fork of Coal Creek. These are well below the allowable increase, which was set at 10% in compliance with the SFLMP.

G. Fisheries (*DEIS, pages III-50 through 51 and IV-50a through 50b)*

Short-term increases in sedimentation are anticipated during the construction of road and bridge improvement projects. All sites would result in a long-term reduction of sediment and long-term benefit to the project area fisheries, including bull trout and westslope cutthroat trout. All affected fishery streams have had McNeill core ratings below 40% for more than a 3-year period, including 2 years that witnessed above-average snow loads and spring rain events. Management direction, with greater than 35% fine materials in spotting gravels (McNeill core rating), but below 40%, is to minimize new sediment loading and correct past discrepancies that continue to contribute sediment to streams. The assessment of effects to fisheries was reviewed by DFWP.

H. Air Quality (*DEIS, pages III-52 and IV-50b)*

Air quality effects should not exceed allowable levels defined by the State Montana Smoke Management Plan and managed by the Montana Air Shed Group.

I. Visual Characteristics (*DEIS, pages III-52 through 53 and IV-51 through 52)*

The modified Alternative C would emulate the low- and moderate-intensity fires that retain more of the large fire-resistant trees within treated stands. The effect of this type of harvesting unit 2 would be visible from the North Fork and Glacier Route 7 roads, but would mimic natural events.

J. Economics (*DEIS, pages III-53 through 55 IV-52 through 59)*

Development costs are estimated to be $350,000; forest improvement costs are anticipated to be approximately $172,530. An estimated $2,008,150 would be returned to the trust. Implementation of the modified Alternative C would provide jobs and income for northwestern Montana.

K. Irretrievable and Irreversible Commitments (*DEIS, page IV-59)*

The trees harvested that are more than 200 years old would be irretrievably lost, but their loss would not be irreversible.

The project area is located on State-owned lands, which are principally valuable for the timber that is on them or for growing timber or for watershed protection (MCA 77-1-402). The proposed timber sale is similar to past projects that have occurred in the area.

The proposed timber sale conforms with the management philosophy adopted by DNRC in the SFLMP and is in compliance with existing laws, policies, guidelines, and standards applicable to this type of proposed action.

## 4. RATIONALE FOR THE PROPOSED DECISION

A. The modified Alternative C is consistent with the goals, objectives, and standards of the SFLMP, and appears to best meet the most vegetation-related objectives. This includes retaining more than twice the amount of old growth committed to in the SFLMP.

B. The modified Alternative C is anticipated to provide a net return to the trust of $1,961,260 and provide some jobs and income for northwestern Montana.

C. Of the alternatives that currently meet project objectives, the modified Alternative C appears to best address comments and issues that were submitted by the general public. In fact, Alternative C was developed as a result of public input.

D. Implementation would result in a long-term benefit to water quality and fisheries by eliminating chronic sources of sedimentation.

E. Unit 3 would be dropped because it is a stand currently meeting the western larch/Douglas fir cover type designation. Coal Creek State Forest is presently short of this cover type, therefore this unit should not be harvested at this time.

F. The prescribed treatments for Unit 1 from Alternative B would be implemented because armillaria in this area is exhibiting signs of being a primary pathogen. The disease is predisposing Douglas fir to bark beetle infestation and both conditions are causing mortality in Douglas fir. Although armillaria is a natural part of the forested landscape, its role is typically more endemic than is being exhibited on Winona Ridge.

Stumps from harvested trees would provide additional inoculm sites that could increase the infection rate of the existing stand structure and species composition. Ponderosa pine, which is resistant to armillaria, would be plant to offset the risk of accelerating infections/mortality by harvesting.

If DNRC is to be successful managing all of its forested lands, then less productive sites, like Winona Ridge, must be managed toward a desired condition in concert with more productive sites, like South Coal.

G. Implementation of road restrictions identified in item 2 would result in a decrease in open-road density, while still allowing public access for recreational purposes during summer and fall seasons and after completion of sale-related activities. The road-restriction plan also improves spring-habitat value for grizzly bears while they are utilizing low-elevation habitats. The fluctuations of habitat values during the summer and fall seasons should be acceptable because by then bears have generally shifted habitat use to mid and upper elevations where fewer roads exist and there is a lower probability of human/bear conflict.

## SUMMARY

Overall, the modified Alternative C complies with the philosophy of the SFLMP by harvesting timber in a manner that moves the Coal Creek State Forest toward appropriate conditions while generating revenue and limiting effects to other valuable resources.

## *NOTIFICATION OF DECISION*

Following publication of the FEIS, the Decisionmaker/Stillwater Unit Manager will review the information contained in the DEIS and project file, including public comments. No sooner than 15 days after the publication of the FEIS, the Unit Manager will determine the following:

- Do the alternatives presented in the FEIS meet the purpose of the project?
- Are the proposed mitigations adequate and feasible?
- Which alternative or combination/modification of alternatives should be implemented? Why?

These determinations will be published in a Record of Decision, which will be distributed to all interested parties.

### PROPOSED SCHEDULE OF ACTIVITIES

After the Record of Decision is published, and if a timber harvest alternative is selected, a Timber Sale Contract package would be prepared. The package would be sent to the Land Board for approval. If the Land Board approves the timber sale, the sale would be advertised. If the timber is sold, the following schedule would apply:

Stillwater Unit proposes to sell timber from the proposed project in July, 1999, and July, 2000, using 2 separate contracts. Timber harvesting and road construction and improvement work would begin in the late summer of 1999 and be completed by April 15, 2002. Planting and hazard-reduction work would be completed within 2 years following the completion of harvesting. Some activities would be restricted to certain periods of the year to avoid or reduce impacts (see Chapter IV and Appendix A in the DEIS for mitigation information).

# FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE CYCLONE/COAL PROPOSED TIMBER SALE

## INTRODUCTION

This document presents changes made to the DEIS for the Cyclone/Coal Timber Harvest Project. In accordance with the Administrative Rules of Montana (ARM) 36.2.530, DNRC has decided to adopt the DEIS as the FEIS, with all corrections, responses to comments, and additional information found in the Cyclone/Coal FEIS errata. All issues raised by the public were either addressed in the DEIS, the responses to comments, or in the additional information that has been provided as part of the FEIS errata; thus, DNRC felt that it was unnecessary to reproduce a full FEIS. This errata, in combination with the DEIS and the Final Environmental Impact Statement Summary, constitutes the Cyclone/Coal Timber Harvest Project Final Environmental Impact Statement (FEIS).

This document consists of three sections:

A. Additions and errata to the DEIS, including the location in the DEIS where the additions or corrections occur.

B. DNRC's Proposed Decision

C. The text of the comments received, immediately followed by the DNRC response.

## A. ADDITIONS AND ERRATA TO THE DEIS

The following pages contain the additions and errata items pertaining to the DEIS. The location in the DEIS where additions or errata occur is identified in the left-hand column. The actual addition or errata is presented in the right-hand column. Except in the case where an entire page or section is added/changed, the additions are printed in bold and the errata are printed in ***bold italics***.

| DEIS PAGE #/LOCATION | ADDITIONS/*ERRATA* |
|---|---|

## SUMMARY

| | |
|---|---|
| PAGE S-2 | 1st column, last paragraph, 1st sentence – ***The mailing list of parties interested in the project is located in the Project File.*** |
| PAGE S-9 | Replace Table II-2 in the DEIS Summary with Table II-2 in the FEIS Summary. |
| PAGE S-12 | Replace Table II-3 in the DEIS Summary with Table II-3 in the FEIS Summary. |

## CHAPTER I

PAGE I-4

1st column, Criteria Used for Project Development, 1st paragraph – delete "*as per DNRC's guidance for the grizzly bear core area.*"

PAGE I-6

1st column, Coal Roadside Timber Permit, change last sentence to read – ***The effects of this vegetation treatment have been analyzed and made a part of this FEIS.***

## CHAPTER II

PAGE II-8

Replace Table II-2 in the DEIS with Table II-2 in the FEIS Summary.

PAGE II-10

Description of Silvicultural Treatments, 1st paragraph – The treatments proposed for the Cyclone/Coal project have been designed to ***emulate*** the historical effects of natural fires. Natural levels of stand structures will be retained. Natural levels of stand structures will be retained. Forest structures would be maintained in various naturally occurring shapes and sizes. Graphical ***representations*** of the proposed silvicultural treatments on harvest units were created. The visualizations are only a qualitative approximation of what would be expected to occur on the ground due to the variations and ***diversity*** of the stands treated in this project. Each visualization ***approximates*** the ***physical*** distribution of the treatment effects across a harvest unit.

PAGE II-11

**Approximately 1 to 2 large, sound trees per acre or 2 of the largest dbh trees would be retained to serve as snag recruits.**

PAGE II-18

Replace Table II-3 in the DEIS with Table II-3 in the FEIS Summary.

## CHAPTER III

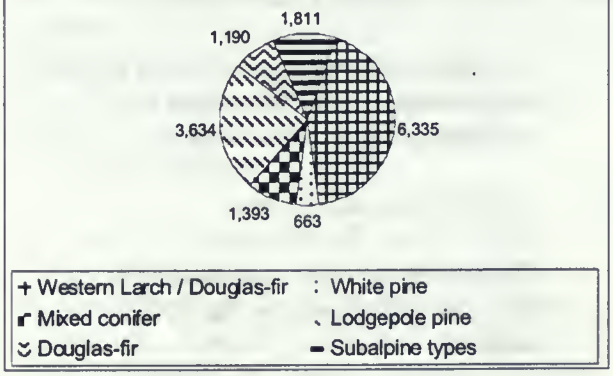
PAGE III-2

Text under Figure III-1 – The mean cover-type patch size is ***125*** acres, while patches of equal age class have a mean size of ***126*** acres. The mixed-conifer cover type patches are the largest with a mean of ***245*** acres. The mean old-growth patch size is ***354*** acres.

PAGE III-3

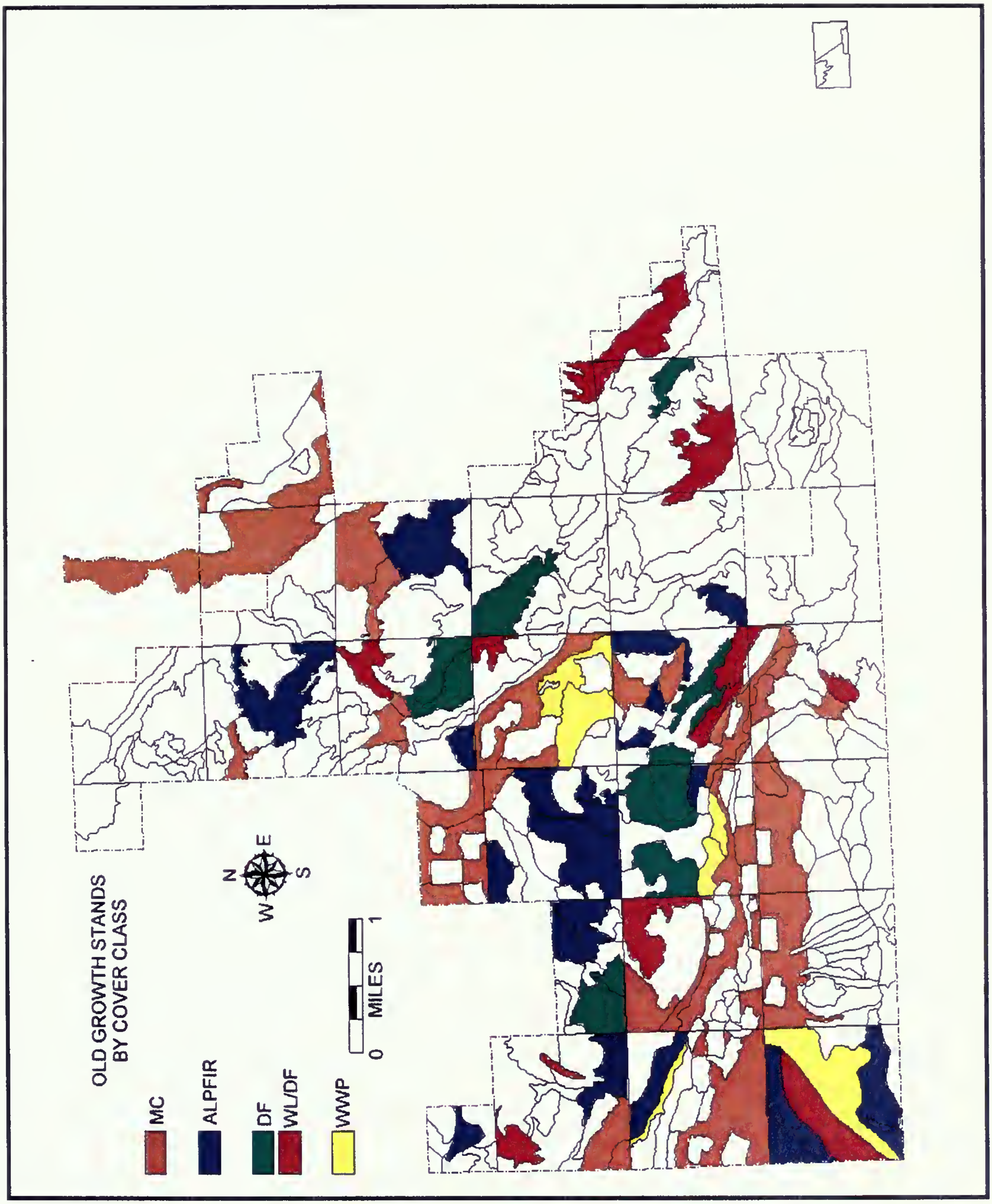
Replace Figure III-4 with the following Figure:

**Figure III-4, Appropriate Acres by Cover Type for the Coal Creek State Forest**



PAGE III-4

Replace Figure III-18 with the following Figure III-18:



PAGE III-5

1st column, 1st full paragraph – *In the following analysis, forest characteristics and cumulative impacts are examined at 4 scales: the stand, Coal Creek State Forest, the Climatic Section, and western Montana.*

PAGE III-7

2nd column, last full sentence – delete ***Lodgepole pine was....***

PAGE III-8

2nd column, 2nd paragraph, 1st sentence – add Climatic Section 333C

PAGE III-10

1st column, 2nd paragraph, 1st sentence – change 101 to ***100***

PAGE III-11

1st column, 2nd paragraph – add **for** before western

PAGE III-15

Current Forest Conditions
- current levels of old-growth attributes including:

- number of large diameter live trees,
- number of snags
- amount of down coarse woody debris
- *degree of decadence*
- *old growth stand structure*
- *stand vigor, and*
- *stocking expressed as board feet per acre.*

Cover-Type Representation – replace paragraph with following text:

*The current age-class structure by cover type for Coal Creek State Forest is shown in Table III-10. Since the 1930s, there has been a large shift in cover type representation to the shade tolerant climax species, primarily from lodgepole pine. The lodgepole pine type has decreased 53 percent, while the mixed conifer type increased 52 percent, and the subalpine fir types increased 28 percent. The trend is similar across the entire ICRB where shade tolerants have doubled compared to historical amounts (ICRBEMP 1997), but is less extreme within the Coal Creek State Forest. Analyses of "appropriate conditions" (p. III-23) suggest longer term shifts in cover type are primarily away from western larch/Douglas-fir to more shade tolerant types.*

PAGE III-16

1st column, 1st paragraph, after 1st sentence – insert the following text:

**Currently 35 percent of all stands are 'old'. In the 1930s inventory, 32 percent of the Coal Creek State Forest existed as old stands. Thus, old stand representation has slightly increased (about 10 percent more today than in the 1930s inventory).**

PAGE III-18

1st column, 1st full sentence – after 'inventory', insert '**summaries,**'

Current Patch Characteristics – insert the following text after last sentence:

**Thus, although some fragmentation of the CCSF has occurred, the amount is considerably less than would appear to be the case at first glance.**

New paragraph after previous sentence:

**Old-growth patches have increased in number from 6 to 15, while at the same time decreasing in mean size from 801 acres to 354 acres. There has been a large increase in patch shape complexity from 1.184 in the 1930s to the current 2.04, or from the least complex age-class patches to the most complex patches. It is doubtful that the explanation offered in the previous paragraph accounts entirely for the changes in old-growth patch characteristics.**

PAGE III-19

1st column, Indicators of Old-Growth Attributes, 1st paragraph, 2nd sentence – change 'old age' to '***old growth***'

1st column, Indicators of Old-Growth Attributes, 1st paragraph, last sentence – change 'old-aged stands' to '***old-growth stands***'.

PAGE III-20

2nd column, last sentence – delete, '***most of***'

PAGE III-21

2nd column, last sentence – delete last sentence

PAGE III-22

st column, Current Forest Condition Summary, 1st paragraph, 2nd sentence – add the following text at the end of the sentence: '**since the 1930s inventory was recorded.**'

PAGE III-23

2nd column, 1st paragraph, last sentence – replace 'of old growth' with '***by cover type***'

PAGE III-24

Table III-15 – insert the following footnote:

**There are no acres classified as appropriate ponderosa pine cover type on the CCSF. Additionally, none were sampled in the 1930s inventory.**

PAGE III-25

1st column, last partial sentence – change Table III-16 to ***Table III-17***.

PAGE III-26

Table III-17, 3rd column – change 110 Class to ***100 Class***

PAGE III-29

2nd column, 2nd paragraph, 5th sentence – delete '***been***'

PAGE III-30

2nd column, 1st complete paragraph, 1st sentence – after 'among', insert '***young and***'

2nd column, 1st complete paragraph, 2nd sentence – delete 'three to fourfold', and insert '***from 801 to 354 acres***'

PAGE III-50

2nd column, Fisheries – after 1st sentence, insert the following text:

**Coal Creek has been recognized as core area for bull trout. Core areas are drainages that currently contain the strongest remaining populations of bull trout. Cyclone Creek, downstream of Cyclone Lake, is disjunct core area and provides nodal habitat, such as migratory corridors, overwintering areas, and critical rearing areas (Flathead River Drainage Bull Trout Status Report, August 1995; prepared for the Montana Bull Trout Restoration Team by the Montana Bull Trout Scientific Group).**

PAGE III-51

2nd column, Cyclone Creek, last sentence – delete last sentence

2nd column, last sentence – insert following text as new paragraph:

**A substrate score is an ocular assessment of streambed particle size and embeddedness. A higher substrate score indicates more favorable fisheries habitat conditions. Low substrate scores indicate smaller streambed particles and greater embeddedness, which constitutes poorer quality fish habitat. McNeil coring is a method used to determine the size range of material in streambed spawning sites. Results indicate the quality of spawning and incubation habitat. The smaller the percentage of fine materials, the better the habitat condition.**

Tables III-19 and III-20 – replace both tables with the following Tables III-19/20:

**TABLE III-19. SUMMARY OF FISHERIES MONITORING DATA IN COAL CREEK**

| Parameter | FY 1995 | FY 1996 | FY 1997 | FY 1998 |
|---|---|---|---|---|
| Bull Trout Redds[1] | 6 | 13 | 3 | 5 |
| Substrate Score | 10.5 (7/94) | 10.8 (7/95) | 10.9 (7/96) | 10.7 (7/97) |
| McNeil Core | 32.6 (3/95) | 37.5 (3/96) | 38.2 (3/97) | No Results[2] |

[1] Coal Creek is too large to conduct spawning surveys for westslope cutthroat trout since this must be conducted during spring runoff.

[2] Sample was taken 3/98, results not compiled to date.

**TABLE III-20. SUMMARY OF FISHERIES MONITORING DATA IN CYCLONE CREEK**

| Parameter | FY 1995 | FY 1996 | FY 1997 | FY 1998 |
|---|---|---|---|---|
| Westslope Cutthroat Redds | 17 | 26 | Fry Present[1] | No Results[2] |
| Bull Trout Redds | 5 | 5 | 5 | No Results[2] |
| Substrate Score | -- | 11.1 (7/95) | 11.3 (7/96) | No Results[2] |
| McNeil Core | -- | 33.1 (3/96) | 31.6 (3/97) | No Results[2] |

[1] Spring runoff prevented the inventory of redds, but fry were observed indicating likely spawning activity.

[2] Data collection complete, results not compiled to date.

### PAGE III-52

2nd column, 1st partial sentence – after 'property', insert ***(See Figure III-17).***

## CHAPTER IV

### PAGE IV-1

2nd column, last paragraph, 1st sentence – after 'below', insert '***the main canopy***'.

### PAGE IV-2

1st column, 3rd paragraph, 1st sentence – after 'below', insert '***the main canopy***'.

2nd column, 3rd & 4th paragraphs, 1st sentence – after 'to', insert '***a total of***'

### PAGE IV-3

1st column, 2nd & 3rd paragraphs, 1st sentence – after 'to', insert '***a total of***'

2nd column, 2nd paragraph, 2nd sentence – change '(harvesting in existing western larch/Douglas-fir old growth....' to '(harvesting in existing ***mixed conifer*** old growth....'

2nd column, 2nd paragraph, last sentence – after 'information,' insert '***refer to discussion on Old-Growth Attributes and***'

### PAGE IV-4

2nd column, 1st partial paragraph, 1st full sentence – after 'B', insert '***and D***'

### PAGE IV-11

Figure IV-10 – Insert labels for ***Alt A*** (top left) and ***Alt B*** (top right)

### PAGE IV-17

1st column, 3rd paragraph, last sentence – after 'remain', insert '***roughly***'

### PAGE IV-18

1st column, Summary of Effects – change heading to read, '***Summary of Cumulative Effects***'

### PAGE IV-19

1st column, Effects of All Action Alternatives on Noxious Weeds – change heading to read, '*Cumulative Effects of All Action Alternatives on Noxious Weeds within the Coal Creek State Forest*'

### PAGE IV-25

2nd column – after 2nd paragraph, insert the following text:

COVER-TYPE CHARACTERISTICS: CUMULATIVE EFFECTS IN WILDLIFE

**These broad patterns in cover types are also reflected in the remainder of the Whitefish Range and portions of the North Fork of the Flathead River valley managed by FNF. Lacking fire, the trend of slow conversion toward shade-tolerant trees will likely continue on the surrounding lands as well. Cumulatively, these trends would tend to be detrimental to species adapted to forests dominated by shade-intolerant trees should no management activities replace fires in their effect. Conversely, if an action alternative were chosen, its effects would be cumulative to any similar timber-harvesting activities that occurred outside Coal Creek State Forest on FNF.**

### PAGE IV-26

1st column, 2nd paragraph, 2nd sentence – delete '***- already in healthy supply on the Coal Creek State Forest -***'

2nd column, 1st partial paragraph – delete last sentence, and insert the following text:

'*Ponderosa pine is present in very low numbers on Winona West. While planting ponderosa pine would not likely seriously reduce the amount of openings as has occurred naturally due to root rot, it would provide the potential to develop some large trees with smaller, rot sensitive Douglas-fir continuing its boom and bust cycle.*'

2nd column – after 2nd paragraph, insert the following text:

## STAND AGE CHARACTERISTICS: CUMULATIVE EFFECTS ON WILDLIFE

**Reductions in the acreage of older forests on Coal Creek State Forest, although minor and evidently resulting in proportions that are within historical norms, would be cumulative to prior reductions that have occurred in the North Fork drainage outside of Coal Creek State Forest. FNF has recently concluded that older forests stands on FNF lands in the North Fork are currently below the range of naturally occurring variation, and they are seriously considering management strategies that would prioritize increasing the abundance of old-growth (USFS 1997).**

PAGE IV-27

1st column – after 1st paragraph, insert the following text:

## PATCH CHARACTERISTICS: CUMULATIVE EFFECTS ON WILDLIFE

**Lacking documentation of patch characteristics for lands outside of Coal Creek State Forest, it is not possible to conduct a quantitative cumulative-effects assessment of this forest attribute. It is probable that the same basic patterns hold both on and off Coal Creek State Forest within the North Fork area.**

1st column – after Fine-Filter Assessment and before Threatened and Endangered Species, insert the following text:

## FINE-FILTER ASSESSMENT

**Cumulative effects were analyzed for all species considered in the fine filter assessment. In all cases, except grizzly bears, only actions occurring on the Coal Creek State Forest were considered in the cumulative effects. Past projects were incorporated in to the cumulative effects analysis using the existing cover types and age classes. The Coal Roadside Timber Permit (CRTP) was considered as a completed project. No future projects or fires were identified or considered. In the future, both projects and fires are highly likely, however, since they are not planned or delineated, we can not analyze their relation to the cumulative effects of this project.**

**For grizzly bears, cumulative effects analysis were conducted within the State Coal Cyclone Bear Management Unit (BMU) subunit. In addition to the above projects, the Dead Horse Resource Management Project was considered for grizzly bears.**

The CRTP occurred in approximately 20-40 acres during the summer of 1998. This salvage harvest focused on blow down in upland communities in or adjacent to past harvest units and near existing roads. Road traffic was regulated to adhere to the restricted road classification under DNRC's grizzly bear internal guidance. Since the harvest activity will not change overstory cover, no significant habitat impacts are expected to occur to most species considered in the fine filter analysis (Blowdown Salvage 98 Checklist Environmental Assessment).

Downed logs contribute to lynx and fisher habitats, while providing feeding sites for pileated woodpeckers. Since overstory cover will not be altered and the salvage areas are below the elevation of preferred habitat of lynx and not associated with riparian areas, no significant impacts to lynx and fisher habitat are expected. Some logs would be left on site to provide feeding sites for pileated woodpeckers and habitat for other species. However, removal of logs from the site would reduce feeding sites for pileated woodpeckers. Therefore, the CRTP will be considered in the cumulative effects analysis of only pileated woodpeckers below.

1st column, Peregrine Falcon – after last sentence, insert the following text:

Peregrine Falcon *(Falco peregrinus)* – CUMULATIVE EFFECTS

This project is not expected to affect peregrine falcon habitat, therefore, no cumulative effects to peregrine falcon habitat are expected.

PAGE IV-28

2nd column, Bald Eagle, 3rd paragraph – after last sentence, insert the following text:

Bald Eagle *(Haliaeetus leucocephalus)* – CUMULATIVE EFFECTS

No habitat manipulation would occur in bald eagle nest site, primary use, or potential nesting habitat zones. Therefore, no cumulative effects to bald eagle habitat in the area would occur under any alternative.

PAGE IV-29

1st column, Wolf, 3rd paragraph – after last sentence, insert the following text:

Wolf *(Canis lupus)* – CUMULATIVE EFFECTS

Because of the importance of big game prey to wolves, the effects of big game use and populations are expected to provide a surrogate index to wolf habitat. Additionally, road densities can affect wolf habitat. The proposed harvests are not expected to substantially alter big game populations, distribution, or habitat use on the Coal Creek State Forest. The impacts of roads are discussed under grizzly bears. Therefore, no significant cumulative effects on habitat are expected under any alternative, while the cumulative effects on wolf habitat effectiveness is expected to be static or positive if road densities are reduced.

1st column, Grizzly Bear, last paragraph – after last sentence, insert the following text:

### Grizzly Bear *(Ursus arctos)*- CUMULATIVE EFFECTS

Since the grizzly bear is a wide ranging species, site specific analysis is less informative than a more comprehensive approach. Therefore, the discussion in the DEIS focuses on the cumulative effects in the State Coal Cyclone BMU subunit. Please refer to the discussion on pages IV-29 through IV-36. The Dead Horse Resource Management Project was not considered in the initial analysis.

The effects of the Dead Horse Resource Management Project were not considered in the DEIS. This project targets 390 acres of white-bark pine and subalpine fir for harvest and prescribed burning. The Dead Horse Management Project may reduce hiding cover by up to 390 acres in the BMU. The Coal/Cyclone Creek timber sale would further reduce hiding cover by 537 to 1,064 acres, depending on the alternative selected. Cumulative analysis of hiding cover disclosed in the DEIS are maintained, although hiding cover would be reduced more than originally disclosed due to consideration of the Dead Horse Resource Management Project. However, hiding cover in the BMU would still greatly exceed the 40% threshold, therefore no significant cumulative effects to hiding cover are expected.

## PAGE IV-37

2nd column, Common Loon – after 1st partial paragraph, insert the following text:

### Common Loon *(Gavia immer)*- CUMULATIVE EFFECTS

Common loon habitat would not be affected by this project, therefore no cumulative effects would occur.

2nd column, Harlequin Duck – after 1st full paragraph, insert the following text:

### Harlequin Duck (*Histrionicus histrionicus*) – CUMULATIVE EFFECTS

Harlequin duck habitat would not be affected by this project, therefore no cumulative effects would occur.

2nd column, Boreal Owl – after last paragraph, insert the following text:

### Boreal Owl (*Aeglius funereus*)- CUMULATIVE EFFECTS

It is unlikely that boreal owls use stands other than those in Unit 5, so there would not be additional impacts to this species regardless of which alternative is chosen.

## PAGE IV-38

1st column, Black-backed Woodpecker – after 2nd paragraph, insert the following text:

### Black-backed Woodpecker *(Picoides arcticus)* – CUMULATIVE EFFECTS

Black-backed woodpecker habitat would not be affected by this project. However, the action alternatives may decrease the chance and/or size of stand replacing fires, thereby impacting the potential for producing black-backed woodpecker nesting habitat.

2nd column, Pileated Woodpecker – after 2nd paragraph, insert the following text:

Pileated Woodpecker (*Dryocopus pileatus*) – CUMULATIVE EFFECTS

Under alternatives A and F, pileated woodpecker habitat would not change significantly in the short-term. However, western larch (a preferred nest tree species) would decrease through time in Units 2 and 5 (713 acres). Over time, the decrease in western larch would limit nesting and feeding sites for pileated woodpeckers on the Coal Creek State Forest, resulting in a decrease of 713 acres of habitat.

Under alternative B and D, 418 acres of existing pileated woodpecker habitat would be removed. This reduction would add to 620 acres of past disturbances, totaling a decrease of 1,018 acres of potential pileated woodpecker habitat on the Coal Creek State Forest. Additionally, removal of the overstory western larch and Douglas fir would reduce recruitment of feeding and nesting sites, which would add to the reduction realized in past harvests and the CRTP. In time, these stands would regenerate in western larch/Douglas fir and provide pileated woodpecker habitat

The effects of alternatives C and E are uncertain. Most of the existing western larch and Douglas fir would be maintained, but the midstory canopy would be removed. Some regeneration of western larch and Douglas fir are expected. If this harvest strategy removes pileated woodpecker habitat, an additional 713 acres of pileated woodpecker habitat would be removed from the Coal Creek State Forest. However, this loss would be a shorter-term reduction than under alternatives B and D. In the short-term, most existing and future feeding and nesting sites would be retained. These alternatives also focus on regenerating western larch and Douglas fir in small patches. Overall, alternatives C and E would result in recruitment of these important tree species for future habitat, while maintaining a majority of the existing important structural components.

2nd column, Northern Bog Lemming – after 1st paragraph, insert the following text:

Northern Bog Lemming (*Synaptomys borealis*) – CUMULATIVE EFFECTS

Since habitat of Bog lemmings is lacking in and around the harvest units, no cumulative effects on bog lemming habitat are expected.

PAGE IV-39

1st column, Fisher – after 3rd paragraph, insert the following text:

Fisher (Martes pennanti) – CUMULATIVE EFFECTS

As described in Chapter III, some 68% of low-elevation riparian zones that potentially provide optimum fisher habitat are of acceptable stocking density. Under Alternatives A and F, this condition would likely remain unchanged for the foreseeable future. Possible biases in this figure were discussed in Chapter III.

All harvest units in Alternatives B, C, D, and E are designed to allow buffers of no less than 50 meters (approximately 165 feet) on either side of streams within habitats likely to provide foraging and resting habitat for fishers. This should allow fishers to forage and travel through these areas at any time during the year. Thus, we do not anticipate substantial effects or cumulative effects on fishers under any alternative.

PAGE IV-41

1st column, Lynx – after 1st paragraph, insert the following text:

### Lynx (*Lynx canadensis*) – CUMULATIVE EFFECTS

To assess connectivity, we produced a map showing all patches in which forest stocking was poor or lacking entirely. These patches were then buffered by 50 meters on each boundary; any mapped patch therefore represented a relatively open area of at least a 100-meter width at its narrowest point. These patches modeled movement barriers to lynx. We then assessed the spatial location of these movement barriers with respect to third-order drainages, as well as stands than contain potential foraging and denning habitat.

Lynx are also susceptible to trapping pressure, which in turn, is facilitated by road access. Issues of road access are considered thoroughly in the assessment of effects on grizzly bears (see Grizzly Bears, above).

Under Alternatives A and F, we expect little immediate change in the capability of Coal Creek State Forest to support lynx. Stands that contain structures appropriate for lynx denning would remain essentially unchanged; as they age, structure on the ground would gradually increase. Over the long term, denning habitat for lynx would probably increase slowly in both quantity and quality. Assuming continued fire suppression, stands that contain early to early/mid-successional structures would gradually decline in abundance. Connectivity between the two elements currently appears sufficient to allow for the free movement of lynx between them (Figure IV-16); this would not change appreciably in either the short or long term. Were fire suppression to continue long term and no additional timber harvests or prescribed burns to occur, the long-term trend would be a reduction in the heterogeneity of forest structures within Coal Creek State Forest and a gradual reduction in lynx habitat quality.

The juxtaposition of harvest units on the landscape (each of which would probably preclude lynx movement during 1 to 2 decades) would not produce large or insurmountable barriers to lynx movement across the landscape (Fig. IV-16). South of Coal Creek (in and near Unit 5), although relatively large patches of young forest would be produced, travel habitat would be retained within the riparian areas associated with all north-flowing creeks, as well as south of the harvest units (higher up on the ridge). Cover that could provide travel habitat would continue to be available on Coal Ridge, separating Coal and Cyclone Creeks. Connectivity between Cyclone Basin and the North Fork of the Flathead would be reduced (because of the harvesting in Unit 2), but the critical patch immediately northeast of Cyclone Lake would remain undisturbed. It is likely that cover in this "saddle" is already an important wildlife travel route, and the security provided by dense cover here would increase in importance following proposed harvests in Section 14 (Unit 2).

In summary, Alternative B would generally provide for a continuation of the shifting, heterogeneous mosaic of habitats that appears to support lynx in this area. Denning habitat would be reduced in extent, but most areas with the highest potential for denning would remain intact. Foraging habitat would remain unchanged or be reduced slightly in the short term, but increase in the longer term. Forest cover that provides connectivity between foraging and denning elements would be reduced from current conditions, but patches that are likely to be used currently would remain intact, and no large barriers to movement would be created.

Effects on lynx produced by Alternative C would be essentially identical to those of Alternative B because Unit 1 (which would be deleted under Alternative C) likely does not form an important habitat component for lynx.

Alternatives D and E include less removal of shade-intolerant canopy trees in Units 2 and 5 than do Alternatives B and C, but a similarly intensive removal of subcanopy shade-tolerant trees. Disturbance to herbaceous vegetation would probably be similar among treatments. In Unit 5, Alternatives D and E call for more extensive (albeit less intensive, see above) treatment than do Alternatives B and C, although the most mesic areas would still be retained. It is likely, however, that the lesser intensity harvests planned under Alternatives D and E would still remove sufficient densities of cover so that removal of potential denning habitat, as projected under Alternatives B and C, would also occur here. As well, forage habitat would probably not be created in the short term, but would be created within a few decades. In short, although the harvest prescriptions in Alternatives D/E differ from Alternatives B/C with respect to the types of fires they emulate and the time-to-return of various old-growth attributes, they probably do not differ appreciably with regard to their effects on lynx denning or forage habitat. Thus, effects on lynx would likely be similar to those described under Alternative B.

1st column, Big Game Species – insert the following text after 'Big Game Species'

Since winter range is the most limiting and potentially the most crucial habitat for big game, cumulative effects to that habitat were analyzed. Only those portions of winter range on the Coal Creek State Forest were considered.

2nd column, Elk – after 5th paragraph, insert the following text:

### Elk – CUMULATIVE EFFECTS

Approximately 40 of 2,000 acres of elk winter habitat on the Coal Creek State Forest were harvested in the past. These stands are believed to have regenerated to provide some snow intercept. Under alternatives A and F, no other modification to elk winter range would occur. Without disturbance, canopy cover would continue to increase, resulting in a decline in elk forage.

Under all the action alternatives, canopy cover would be reduced and forage production would increase in harvested units. If snow intercept is limiting to elk wintering in this area, the proposed project would reduce the value of these stands for elk winter range. Under alternatives B and C, 394 acres of elk winter range would be affected. Under alternatives D and E, 164 acres of elk winter range would be affected. These impacts would be maintained until the stand regenerated and provided adequate snow intercept. Conversely, if forage is limiting on this winter range, the alternatives would enhance the quality of winter range by the same acreage and for the same length of time as discussed above.

## PAGE IV-42

1st column, Mule Deer – after 5th paragraph, insert the following text:

### Mule Deer– CUMULATIVE EFFECTS

No past harvests occurred in mule deer winter range. Approximately 75% of Unit 1 on Winona Ridge is considered mule deer winter range. Therefore, only alternatives B and C would affect approximately 175 of 700 acres of mule deer winter range on the Coal Creek State Forest. The effects of harvest should generally mimic elk habitat. However, mule deer are more sensitive to snow intercept, therefore the impacts would be slightly more detrimental.

2nd column, White-tailed Deer – after 3rd paragraph, insert the following text:

### *White-tailed Deer– CUMULATIVE EFFECTS*

No harvests are planned in white-tailed deer winter range. Therefore, no cumulative effects from this project are expected.

## PAGE IV-43

1st column, Moose – after 1st partial paragraph, insert the following text:

### Moose– CUMULATIVE EFFECTS

Approximately half of the past harvest activities occurred in moose winter range. These harvest units should have regenerated to provide winter forage for moose. Therefore, under alternatives A and F, moose winter range would not be altered. Under alternatives B and D, moose winter range would decrease by approximately 848 and 616 acres, respectively. Under alternatives C and E, the effects of the thinning from below are unclear. If the treatments affect moose winter range to the extent clearcutting would, then winter range would decrease by 848 and 616 acres, respectively. However, thinning from below would maintain more snow intercept and sapling trees than in

**clearcutting prescriptions, therefore the impacts to moose winter range are expected to be less than in alternatives B and D.**

PAGE IV-52

1st column, Visual Characteristics – after 4th paragraph, insert the following text:

**Visual Characteristics – CUMULATIVE EFFECTS**

**As is evident from Figure II-1 in the DEIS, there are numerous old harvest units within the Coal Creek State Forest. When viewing Figure II-3, one can see that units 2and 5 will connect past harvest units, thus creating overall larger patches. From a visual standpoint, the harvest units will blend more naturally into the landscape and will serve to emulate large natural disturbances that historically would have influenced the view of the landscape throughout time.**

2nd column, Economics (Methods), 1st paragraph – after 2nd sentence, insert the following text:

**Costs, revenues, and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of net return.**

PAGE IV-55

2nd column, 3rd paragraph, 2nd sentence – change 'graded' to ***'gated'***

PAGE IV-57

Table IV-24, footnote – change line machine from $106 to ***$142***

## REFERENCES

PAGE IV-61

Add the following reference:

**McCool, Stephen F. and Richard W. Haynes. 1996. Projecting population change in the Interior Columbia River Basin. United States Department of Agriculture, Forest Service. PNW-RN-519. 14 pp.**

## GLOSSARY

PAGE G-4

Old Growth – delete definition and insert the following text:

***Old growth is defined as stands that are 150 (140 for lodgepole pine) years and older that exhibit a range of structural attributes associated with old age.***

Old Stands – delete definition and insert the following text:

***Term used by Losensky (1997) to describe stands from the 1930s inventory with an average age of 150 years and older (140 for lodgepole pine).***

## APPENDIX A – STIPULATIONS AND SPECIFICATIONS

PAGE A-3

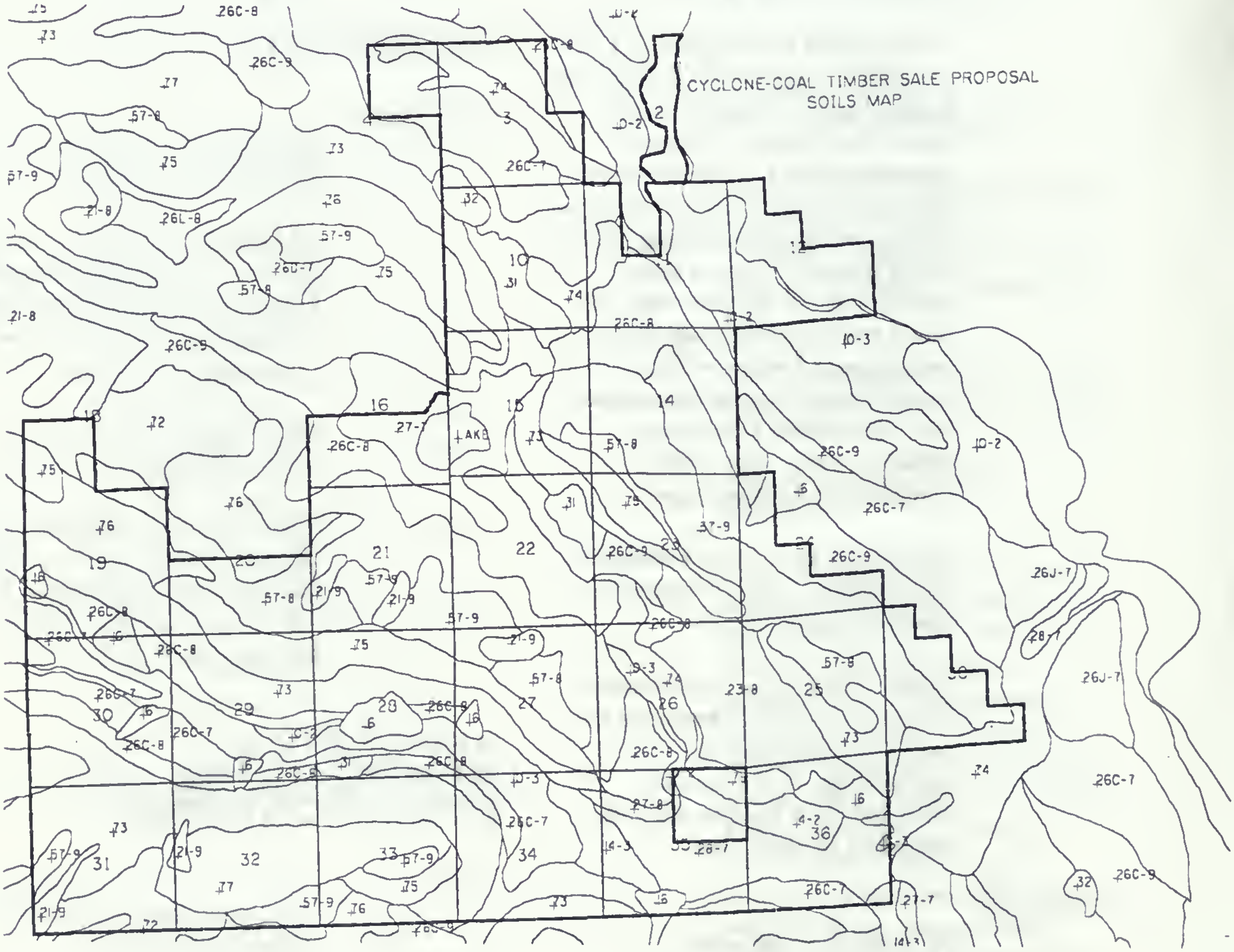
1st column, Grizzly Bears, #2. – change text to read:

Logging camps may be permitted only after discussions with the forest officer. Before authorizing any logging camps, the forest officer must consult with a DNRC biologist.

# APPENDIX B – SOILS

PAGE B-3

Replace old map with the following Soils Map:



## B. PROPOSED DECISION

This portion of the FEIS presents the proposed decision by Robert L. Sandman, Stillwater Unit Manager, DNRC:

The scope of the proposed decision is limited to actions associated with the Cyclone/Coal Timber Harvest Project Proposal. The proposed decision is site-specific, and is neither programmatic nor a general management plan for Coal Creek State Forest.

An interdisciplinary team (ID Team) has completed the Draft Environmental Impact Statement (DEIS), and prepared the Final Environmental Impact Statement (FEIS) for the Cyclone/Coal Timber Harvest Proposal. After a thorough review of the DEIS, project file, public correspondence, corrections and additions made by DNRC that were reflected in this FEIS, Department policies, standards and guidelines, and the State Forest Land Management Plan (SFLMP), Mr. Sandman proposes the following decision.

### 1. PROPOSED ALTERNATIVE SELECTION

Six alternatives were developed and are presented in the FEIS:

- Alternative A, the No-Action Alternative - includes existing activities, but does not include a timber sale;
- Alternative B harvests approximately 10.6 million board feet (MMBF) from 931 acres in 7 units;
- Alternative C harvests approximately 9.5 MMBF from 1,226 acres in 7 units;
- Alternative D harvests approximately 9.8 MMBF from 699 acres in 6 units;
- Alternative E harvests approximately 8.9 MMBF from 994 acres in 6 units; and,
- Alternative F defers timber management for 2 years (*DEIS, page II-3 through II-9*).

After the alternatives were analyzed, Department of Fish, Wildlife, and Parks (DFWP) informed DNRC that funding from their sources would not be available for Alternative F. Therefore, Alternative F no longer meets project objectives (*DEIS, page II-17*).

Alternative A would not immediately affect cover types. However, without treatment or disturbance, cover types would continue to shift toward shade-intolerant species and away from the desired future conditions (*DEIS, page IV-1*). Because fire suppression activities would continue, it is unlikely that natural disturbances by fire would occur similar to historic proportions. Therefore, it is unlikely that Alternative A would move Coal Creek State Forest in a direction that complies with the philosophy of the SFLMP.

To varying degrees, the remaining 4 action alternatives meet project objectives and could be chosen.

The proposed decision is to select Alternative C with the following modifications and specifications:

A. Unit 3 would be dropped from harvest consideration.

B. The proposed treatments for Unit 1 would not be implemented as described for Alternative C. Instead, the proposed treatments listed for Unit 1 would be implemented as described for Alternative B (harvest approximately 810 MBF from 232 acres, plant ponderosa pine).

C. No harvesting activities would occur in the South Coal area (Unit 5) during a year that mechanized activities are taking place on access roads to Section 14 (Unit 2).

D. The harvest units would be sold in two contracts. The first contract would harvest units 2, 4, 5, 6, and 7, totaling 4,113 MBF, from 463 acres, starting in 1999. The second contract would harvest units 1 and 5, totaling 5,265 MBF, from 727 acres, starting in 2000.

E. Spur Road should be used to access Unit 2 instead of Hay Creek Road. The Hay Creek Road could be used if the number of trips complies with the appropriate DNRC grizzly bear guidelines.

F. All gates shown on the "Road-Segment Closure" Map would be installed with the following implementation plan:

- Road segments A and B would be restricted in the spring to protect the road surface from damage. As soon as the road surface is firm enough to allow unrestricted use, the closure would be opened.

- Road segment C would be restricted year-round each year.

- Road segment B would be restricted year-round during the years that motorized activities required in Unit 2 exceed the number of trips allowed by DNRC grizzly bear guidelines.

- Road segment D would be restricted from November 15 to July 1 of each year.

G. The only option for motorized access to unit 2 may be the Hay Creek Road. If this happens, and the number of trips must exceed DNRC grizzly bear guidelines, then all four road segments (A, B, C, and D) would be restricted each year that motorized activity occurs in unit 2.

H. The stipulations and specifications listed in Appendix A of the DEIS would be implemented.

I have compared the modifications and specifications proposed for Alternative C to the analysis presented in the FEIS, and have concluded that the modifications and specifications are within the scope of the FEIS.

The rationale for this decision is presented in item 4.

### 2. RELATIONSHIP OF THE OBJECTIVES TO THE PROPOSED DECISION

A. Return To The Trust - The modified Alternative C would produce an estimated $1,961,260 return to the trust. Although the short-term revenue of the modified Alternative C is lower than either Alternatives B or D, the long-term revenue potential is higher given:

- the difference in the potential timber value remaining after harvesting in Units 2 and 5,
- the increased conversion of mixed conifer and subalpine types to western larch/Douglas-fir, and
- future treatment/retention options that this alternative provides.

B. Biodiversity - Alternative C appears to best meet the most vegetative-related objectives, particularly converting stands of mixed conifer back to old-growth western larch/Douglas-fir cover types, having minimum effects on overall stand structure, improving vigor, not changing age-class distribution, and maintaining the largest old-growth shape sizes.

### 3. RELATIONSHIP OF THE ISSUES AND PUBLIC COMMENT TO THE PROPOSED DECISION

A. Forest Conditions *(DEIS pages III-1 through 26 and IV-1 through IV-18)*

Acres harvested by the modified Alternative C by cover type are alpine fir, 230; Douglas-fir, 183; lodgepole pine, 179; mixed conifer, 520; western larch/Douglas-fir, 28; and western white pine, 50. Postharvest cover type acres within harvested units are alpine fir, 0; Douglas-fir, 183; lodgepole pine, 159; mixed conifer, 0; western larch/Douglas-fir, 834; and western white pine, 50. The alternative increases the western larch/Douglas-fir cover by 770 acres.

The modified Alternative C reduces old-growth stands by 6 acres to 5,300 acres, which is more than twice as many acres required by the SFLMP commitment of 2,142 acres. Harvest treatments would result in 931 acres of stands still being considered as old growth post harvest. The modified Alternative C slightly changes the age-class distribution.

The old-growth attributes remaining after harvesting the modified Alternative C would be:

- 2,597 acres with many large, live trees; 2,173 acres with some large, live trees; 424 acres with few large, live trees; and, 53 acres with no large, live trees (live trees more than 21 inches in diameter).
- 901 acres with many snags; 2,915 acres with some snags; 954 acres with few snags; and, 530 acres with no snags.
- 1,007 with much coarse, woody debris; 159 acres with some coarse, woody debris; 1,855 with little coarse, woody debris; and, 2,279 coarse, woody debris. The acres do not reflect abundance of debris, rather a comparison to the other alternatives.
- 3,498 acres with some decadence; 1,537 acres with little decadence; and, 265 acres with no decadence.

Vigor would improve from a rating of 2.42 to 2.38.

The modified Alternative C has a pronounced effect on increasing the vigor of old-growth stands, increasing multistory proportions, and decreasing 2-storied old-growth stands. However, the modified Alternative C would not produce a substantial shift in the character of the overall remaining old growth. The modified Alternative C reduces old-growth patch size by approximately 4 acres to 250.9 acres mean patch size. Mean age-class patch size would be reduced from 126 acres to 124.7 acres.

B. Noxious weeds (*DEIS, pages III 26 and IV-19 through 20)*

Spotted knapweed is the dominant noxious weed along open roads in Coal Creek State Forest. Equipment would be cleaned prior to entering the project area. Use of the herbicide, Tordon, is not extensive, nor is it being applied to sensitive areas. Herbicide use is strictly controlled through Environmental Protection Agency (EPA) requirements. Herbicide application would adhere to Montana Best Management Practices (BMPs) and the herbicides specific label guidelines. Any 'no-spray' areas would be designated on the ground before application to prevent detrimental effects to some aquatic species. These actions would prevent extensive or severe noxious-weed infestation or spread.

C. Soil *(DEIS, pages III 26 through 27 and IV-21 through IV-22)*

The area of soils affected would be limited to less than 15% of the total harvest unit area. Existing skid trails would be used to avoid cumulative impacts to soils, and mitigation measures would be implemented to comply with BMPs and maintain long-term soil productivity.

D. Natural Area (*DEIS, pages III-27 through 28 and IV-23 through 24)*

The modified Alternative C would harvest approximately 232 acres on the west slope of Winona Ridge. No new roads would be built and the harvest prescription involves dispersed partial cutting, thus preserving a largely natural appearance. In the short term, the modified Alternative C has the potential to slightly reduce the option for a future natural area designation in or around Cyclone Basin, or at least reduce the geographic scope.

E. Wildlife (*DEIS, pages III-29 through 47 and IV-24 through 43)*

1) Coarse-filter Assessment

Modifications of forest types resulting from implementing the modified Alternative C move the forest toward an appropriate condition, which should, generally, have a positive effect on the habitat features available for wildlife. The DEIS, pages IV-24 through IV-25, note areas that were considered for timber harvesting, such as stands that surround Cyclone Lake, but were rejected; keeping these areas in their current condition was deemed more important for reasons of ecosystem integrity related to wildlife.

Cover type, stand age, and patch characteristics postharvest would not appear to substantially differ from the mosaics that probably typified Coal Creek State Forest before effective fire suppression.

Given older forest stands on adjacent lands are currently below the range of naturally occurring variations in old forests, a reduction in acreage of older forests, although within historic proportions, would negatively affect species associated with older undisturbed forests.

2) Fine-filter Assessment

It was an impossible and unnecessary task to assess the existing status of, or evaluate the effects of, the proposed actions on all wildlife species and for specific habitats in the project area for the modified Alternative C. However, to ensure that the important habitat elements for wildlife species were sufficiently analyzed, wildlife Federally listed as threatened or endangered, species listed as sensitive by DNRC, and species managed as big game by DFWP were addressed.

a) Peregrine falcon

Impacts would be temporary and minor with no effect on peregrine falcon populations.

b) Bald eagle

Restricting motorized access to Cyclone Lake from November 15 to July 1 each year would benefit nesting eagles. None of the activities associated with the modified Alternative C involve timber harvesting or mechanized activity in either of the nest site areas, primary-use site areas, or potential nesting habitat zones. The entrance to the trail from Road 4A would be gated and posted. This may help decrease unlawful motorized access to Cyclone Lake. No helicopter flights to harvest Unit 1 would be allowed before August 1 to avoid disturbing nesting eagles, and timing restrictions on helicopter flights of the Cyclone lake outlet would be included in the timber sale contract.

c) Wolf

No discernible effect on wolves is anticipated given the stipulations and specifications in Appendix A.

d) Grizzly bear

Four specific indices were used to assess effects to grizzly bears.

- Road Density - No total road density increase would occur. The road restrictions presented as specifications for modified Alternative C would result in a 7% decrease in open-road density when motorized activities are required in Unit 2, and a 1% decrease when motorized activities are required in Unit 5. If Hay Creek Road is needed for more trips than allowed by guidance, there would be a 0% increase/decrease in open-road density for unit 2.

- Security habitats (referred to as Core Areas) would be maintained at current levels, totaling 5,894 acres.

- Seasonal indices for grizzly bear habitat, as a result of prescribed road restrictions, would improve spring habitat by 4%; would result in a no-net loss for summer habitat; and would result in a habitat improvement of 1% in autumn when mechanized activities are required in Unit 2. When mechanized activities are required in Unit 5, the prescribed restrictions would result in a 6% increase in spring habitat value; an 8% decrease in summer; and a 6% decrease in fall. If Hay Creek Road is needed for more trips than allowed by guidance, the prescribed restrictions would result in a 1% increase in spring habitat value; a 4% increase in summer; and a 7% increase in fall.

- Hiding cover would be reduced from the current 80% to 72%.

In summary, the modified Alternative C results in a slight decrease in open-road density, a slight increase in spring habitat values, and slight increases or decreases in summer and autumn habitat values, depending on the locations of mechanized activities, and hiding cover would be reduced to 72%. Overall, the modified Alternative C meets and exceeds current DNRC grizzly bear guidelines.

e) Common loon

Prescribed road restrictions, gating the entrance to the trail that accesses Cyclone Lake, and placing an informative floating sign on Cyclone Lake near the loon brood-rearing area should offset the effects of harvesting Unit 1. In the long term, they should also produce a net benefit to nesting common loons by potentially decreasing human activity on Cyclone Lake.

f) Harlequin duck

Harlequin ducks would not be affected by this action.

g) Boreal owl

The effect of the modified Alternative C is not clear. However, it has been suggested that some kinds of thinnings, like that prescribed for Unit 5, can be consistent with managing for boreal owls.

h) Black-backed woodpeckers

Indirectly, the modified Alternative C reduces the potential for nesting capability from its current potential by reducing the risk of stand-replacement fires. However, a number of recent large fire events in the North Fork are providing available habitat.

i) Pileated woodpecker

Effects of modified Alternative C are not clear. Overstory trees would remain in place; however, thinning from below may reduce habitat suitability.

j) Northern bog lemming

No effects are anticipated.

k) Fisher

The modified Alternative C would reduce the overall habitat quality for fisher by removing near-ground structures that fishers prefer in harvest units. However, all harvest units provide buffers on either side of streams and adequate travel corridors would remain. Thus, substantial effects are not anticipated.

l) Lynx

The modified Alternative C would reduce forage quality in the short term, but would likely produce a high-quality forage environment within a few decades. Travel habitat would be retained. Denning structures within harvest units would be reduced, but this would not produce a large or insurmountable barrier across the landscape.

m) Big game

No detrimental effects are anticipated for big game.

F. Watershed (*DEIS, pages III-47 through 50 and IV-43 through 50)*

The effects of the modified Alternative C may create a short-term increase in sedimentation, but prescribed activities would lead to a long-term net benefit to water quality by eliminating several existing sources of sediment.

A 4% increase in water yield is anticipated for Cyclone Creek, a 2% increase for Lower Coal Creek, and a 3% increase for the South Fork of Coal Creek. These are well below the allowable increase, which was set at 10% in compliance with the SFLMP.

G. Fisheries (*DEIS, pages III-50 through 51 and IV-50a through 50b)*

Short-term increases in sedimentation are anticipated during the construction of road and bridge improvement projects. All sites would result in a long-term reduction of sediment and long-term benefit to the project area fisheries, including bull trout and westslope cutthroat trout. All affected fishery streams have had McNeill core ratings below 40% for more than a 3-year period, including 2 years that witnessed above-average snow loads and spring rain events. Management direction, with greater than 35% fine materials in spotting gravels (McNeill core rating), but below 40%, is to minimize new sediment loading and correct past discrepancies that continue to contribute sediment to streams. The assessment of effects to fisheries was reviewed by DFWP.

H. Air Quality (*DEIS, pages III-52 and IV-50b)*

Air quality effects should not exceed allowable levels defined by the State Montana Smoke Management Plan and managed by the Montana Air Shed Group.

I. Visual Characteristics (*DEIS, pages III-52 through 53 and IV-51 through 52)*

The modified Alternative C would emulate the low- and moderate-intensity fires that retain more of the large fire-resistant trees within treated stands. The effect of this type of harvesting unit 2 would be visible from the North Fork and Glacier Route 7 roads, but would mimic natural events.

J. Economics (*DEIS, pages III-53 through 55 IV-52 through 59)*

Development costs are estimated to be $350,000; forest improvement costs are anticipated to be approximately $172,530. An estimated $2,008,150 would be returned to the trust. Implementation of the modified Alternative C would provide jobs and income for northwestern Montana.

K. Irretrievable and Irreversible Commitments (*DEIS, page IV-59)*

The trees harvested that are more than 200 years old would be irretrievably lost, but their loss would not be irreversible.

The project area is located on State-owned lands, which are principally valuable for the timber that is on them or for growing timber or for watershed protection (MCA 77-1-402). The proposed timber sale is similar to past projects that have occurred in the area.

The proposed timber sale conforms with the management philosophy adopted by DNRC in the SFLMP and is in compliance with existing laws, policies, guidelines, and standards applicable to this type of proposed action.

## 4. RATIONALE FOR THE PROPOSED DECISION

A. The modified Alternative C is consistent with the goals, objectives, and standards of the SFLMP, and appears to best meet the most vegetation-related objectives. This includes retaining more than twice the amount of old growth committed to in the SFLMP.

B. The modified Alternative C is anticipated to provide a net return to the trust of $1,961,260 and provide some jobs and income for northwestern Montana.

C. Of the alternatives that currently meet project objectives, the modified Alternative C appears to best address comments and issues that were submitted by the general public. In fact, Alternative C was developed as a result of public input.

D. Implementation would result in a long-term benefit to water quality and fisheries by eliminating chronic sources of sedimentation.

E. Unit 3 would be dropped because it is a stand currently meeting the western larch/Douglas fir cover type designation. Coal Creek State Forest is presently short of this cover type, therefore this unit should not be harvested at this time.

F. The prescribed treatments for Unit 1 from Alternative B would be implemented because armillaria in this area is exhibiting signs of being a primary pathogen. The disease is predisposing Douglas fir to bark beetle infestation and both conditions are causing mortality in Douglas fir. Although armillaria is a natural part of the forested landscape, its role is typically more endemic than is being exhibited on Winona Ridge.

Stumps from harvested trees would provide additional inoculm sites that could increase the infection rate of the existing stand structure and species composition. Ponderosa pine, which is resistant to armillaria, would be plant to offset the risk of accelerating infections/mortality by harvesting.

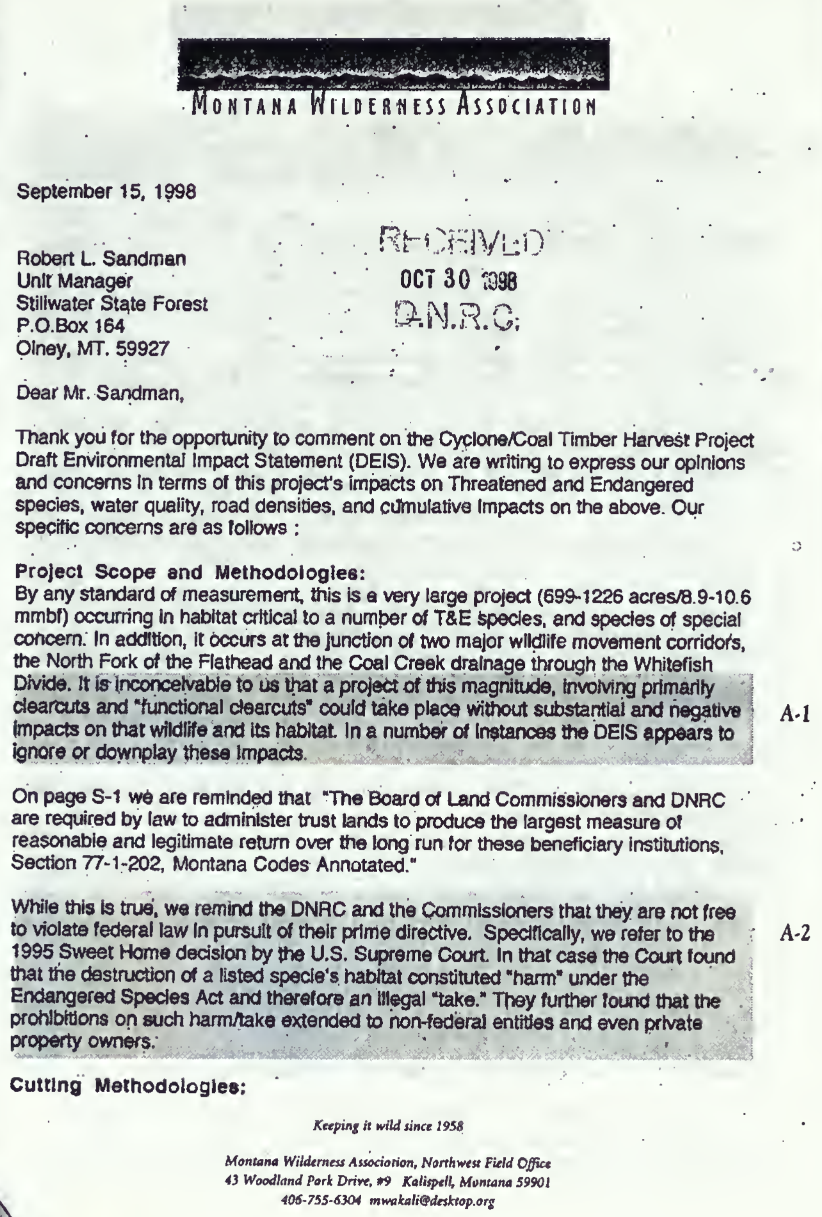
If DNRC is to be successful managing all of its forested lands, then less productive sites, like Winona Ridge, must be managed toward a desired condition in concert with more productive sites, like South Coal.

G. Implementation of road restrictions identified in item 2 would result in a decrease in open-road density, while still allowing public access for recreational purposes during summer and fall seasons and after completion of sale-related activities. The road-restriction plan also improves spring-habitat value for grizzly bears while they are utilizing low-elevation habitats. The fluctuations of habitat values during the summer and fall seasons should be acceptable because by then bears have generally shifted habitat use to mid and upper elevations where fewer roads exist and there is a lower probability of human/bear conflict.

## SUMMARY

Overall, the modified Alternative C complies with the philosophy of the SFLMP by harvesting timber in a manner that moves the Coal Creek State Forest toward appropriate conditions while generating revenue and limiting effects to other valuable resources.

# COAL CREEK
# COMMENTS AND RESPONSES



MONTANA WILDERNESS ASSOCIATION

September 15, 1998

RECEIVED
OCT 30 1998
D.N.R.C.

Robert L. Sandman
Unit Manager
Stillwater State Forest
P.O.Box 164
Olney, MT. 59927

Dear Mr. Sandman,

Thank you for the opportunity to comment on the Cyclone/Coal Timber Harvest Project Draft Environmental Impact Statement (DEIS). We are writing to express our opinions and concerns in terms of this project's impacts on Threatened and Endangered species, water quality, road densities, and cumulative impacts on the above. Our specific concerns are as follows :

**Project Scope and Methodologies:**
By any standard of measurement, this is a very large project (699-1226 acres/8.9-10.6 mmbf) occurring in habitat critical to a number of T&E species, and species of special concern. In addition, it occurs at the junction of two major wildlife movement corridors, the North Fork of the Flathead and the Coal Creek drainage through the Whitefish Divide. It is inconceivable to us that a project of this magnitude, involving primarily clearcuts and "functional clearcuts" could take place without substantial and negative impacts on that wildlife and its habitat. In a number of instances the DEIS appears to ignore or downplay these impacts. A-1

On page S-1 we are reminded that "The Board of Land Commissioners and DNRC are required by law to administer trust lands to produce the largest measure of reasonable and legitimate return over the long run for these beneficiary institutions, Section 77-1-202, Montana Codes Annotated."

While this is true, we remind the DNRC and the Commissioners that they are not free to violate federal law in pursuit of their prime directive. Specifically, we refer to the 1995 Sweet Home decision by the U.S. Supreme Court. In that case the Court found that the destruction of a listed specie's habitat constituted "harm" under the Endangered Species Act and therefore an illegal "take." They further found that the prohibitions on such harm/take extended to non-federal entities and even private property owners. A-2

**Cutting Methodologies:**

*Keeping it wild since 1958*

*Montana Wilderness Association, Northwest Field Office*
*43 Woodland Park Drive, #9 Kalispell, Montana 59901*
*406-755-6304 mwakali@desktop.org*

A. Montana Wilderness Association:

A-1. Without knowing the specific wildlife species and habitats referred to in the question, it is difficult to clearly address this specific concern. The DEIS states in several locations that certain species or groups of species would be impacted under each alternative. In each case, the effects were discussed using the alternative, and not by the harvest method. Therefore, the effects of clearcutting are not apparent, but are discussed under the alternatives.

In several areas in the DEIS, we disclosed negative impacts of the alternatives. In the coarse filter analysis, impacts to groups of species were disclosed by alternative (DEIS pages IV-25-26). In the fine filter assessment, threatened, endangered, big game, and DNRC sensitive species habitat were considered. In this analysis, habitat impacts to several species were disclosed by alternative (DEIS pages IV-36-42). All action alternatives move the forest vegetation of the Coal Creek State Forest toward historical conditions; thereby the net ecological effects of the treatments are believed to be positive, albeit not necessarily for all the resident species.

A-2. We appreciate this concern and we are aware of the 1995 "Sweet Home" decision by the U.S. Supreme Court that prohibits "take" through means of "significant habitat modification or degradation where it actually kills or injures wildlife." We believe that we presented the effects to threatened and endangered species accurately in the DEIS (specifically for peregrine falcon, bald eagle, grizzly bear, and gray wolf pp. IV-27 to IV-36 in Draft EIS). Also, we believe appropriate mitigations designed to minimize adverse effects to these species and conform to DNRC's SFLMP Guidance were disclosed. We feel that this project complies with the provisions of the Endangered Species Act, but recognize that ultimately, the authority to determine "harm" that is caused by a given action rests with the USFWS.

If we count only the acres that DNRC lists as clearcuts, we see that the alternatives range from 616 - 693 acres clearcut. When we add in those harvest methods that are little more than clearcuts (seed tree with reserves), the totals go even higher.

In a 1994 research report, "Grizzly Bear Habitat Use and Silvicultural Management", Reagan, Moody, and Gillin found, "Clearcuts offered significantly less vertical and horizontal security than bear locations...Bears selected areas of higher cover density than were available in clearcuts...No previous research has documented that silvicultural treatments such as clearcutting provide any benefits for grizzly bears...Indeed, clearcutting may have especially deleterious effects in areas... characterized by low moisture regimes and slow regeneration rates." A-3

In addition, Mace and Jonkel (1980) found that a radio collared grizzly avoided a drainage where active logging was underway; Zager (1980) found that radio collared grizzlies avoided clearcuts; and Waller (1992) in the South Fork Flathead found that, "...stands logged in the study area within the last 10 years are unavailable as grizzly bear habitat and should be recognized as such."

**Adherence to North Fork Conceptual Strategy:** A-4

In 1991, Montana Governor Stephens asked the Flathead Basin Commission to initiate a process to define appropriate levels of development and management strategies for the North Fork. A Steering Committee consisting of major private landowners, federal, state, and local government land managers, plus conservation and industry representatives was formed. This group developed and accepted by consensus a North Fork Of Flathead River Conceptual Strategy on September 22, 1992.

In that document, the DNRC (Dept. of State Lands) agreed to a number of management standards, including the following two :

1. "Manage the forest to produce a reasonable and legitimate income for the state trust funds while giving management preference to the special designations, critical wildlife habitat, and non-degradation of water quality over all other management practices."

2. "Manage the forest to produce a reasonable and legitimate income for the state trust funds while giving management preference to preserve and restore the gray wolf, grizzly bear, bald eagle, peregrine falcon, and other species of special concern such as bull trout and large ungulates ***over all other*** management practices" (emphasis added).

In reading the DEIS, it appears the agreed to mandate to protect wildlife, habitat, and water quality has been forgotten.

**Threatened and Endangered Species:**

1. Grizzly Bear - The "best available science" on motorized access density and Core Area size to preserve and restore grizzlies was done right here on the South Fork of A-5

A-3. The study by Reagon et al. (1994) quoted in the above comment was conducted on the Shoshone National Forest in the Yellowstone Ecosystem. Although information from other ecosystems may apply to the NCDE, care in extrapolation is strongly advised. In the Yellowstone Ecosystem, the area is drier and more open. In this study, 73% of the study area supported grass/sagebrush/barren habitat types, indicating a possible shortage of hiding cover in the study area. Also, forest regeneration was lacking after 10-40 years, thereby reducing cover in a study area where cover appeared limited initially.

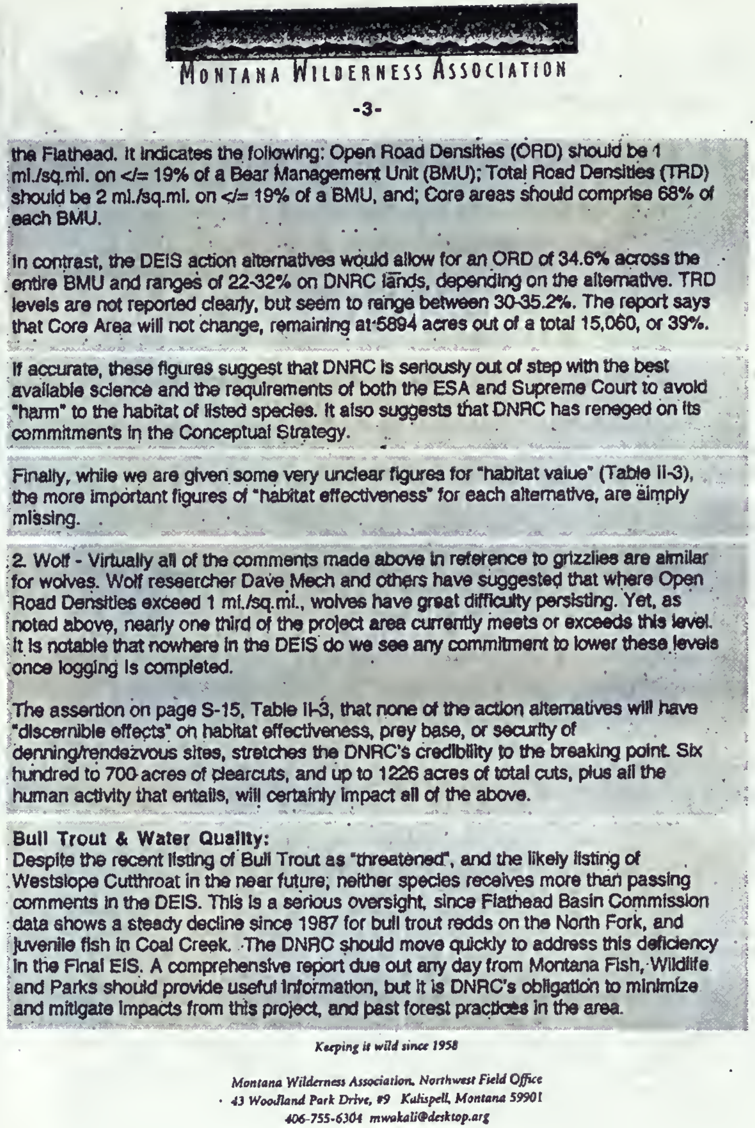
In contrast, the Coal Creek State Forest is comprised mainly of forested habitat types. The analysis area contains approximately 80% hiding cover. Scarification and/or planting are planned in each harvest unit and successful regeneration is expected within 5-15 years. The low amounts of horizontal security cover, hiding cover, and the slow regeneration rates in clearcut units on the Shoshone National Forest, in most cases, are not characteristic of clearcuts in the Coal Creek State Forest.

The assertion "no previous research has documented that silvicultural treatments such as clearcutting provide any benefits for grizzly bears..." made by Reagon et al. (1994) is misleading. Although several studies failed to document significant increases in grizzly bear use of recently harvested units, several studies indicated a positive influence of timber harvest on grizzly bear food sources. Studies from Zager (1980), Zager et al. (1983), Martin (1983), and Waller (1992) suggest harvesting timber may promote fruit production of huckleberry (Vaccinium spp.) and mountain ash (Sorbus spp.) among other forage species. This would result in a potential increase in summer and autumn forage for grizzly bears. However, the ability of grizzly bears to use these areas may be substantially impacted by human disturbance (Zager 1980, Zager et al. 1983, Waller 1992).

In the Cyclone/Coal project, we expect harvest activities to displace bears during the operation (Mace and Jonkel 1980) and that bears will avoid the interior of large, stand-replacement harvests for the first few years post-cutting (Mace and Waller 1997). Under the action alternatives, blocks of cover would be maintained in SMZ, equipment restriction zones, and in reserve areas. These patches of cover are expected to limit bear avoidance of the project area. Opening canopies, in general, stimulates understory production, typically increasing forage production. However, mechanical scarification in Units 3, 4, 5 (partially), and 6 may impact the increase in production. Broadcast and jackpot burning in Units 1, 2, 5 (partially), and 7 may stimulate sprouting and enhance grizzly bear forage (Zager 1980).

A-4. DNRC participated on the Steering Committee that produced the Conceptual Strategy in 1992. It displays conceptual strategies and goals that were intended to help guide participant activities. In the Conceptual Strategy, there are eight items specific to DNRC, including the two presented above by the Montana Wilderness Association.

DNRC believes that the State Forest Land Management Plan (SFLMP), adopted by the State Land Board in 1996, explains the philosophies and management standards that frame out how DNRC manages State-owned forests. This includes the Coal Creek State Forest. The Cyclone/Coal Timber Harvest Proposal was developed following the philosophies and management standards in the SFLMP.



MONTANA WILDERNESS ASSOCIATION

-3-

the Flathead. It indicates the following: Open Road Densities (ORD) should be 1 mi./sq.mi. on </= 19% of a Bear Management Unit (BMU); Total Road Densities (TRD) should be 2 mi./sq.mi. on </= 19% of a BMU, and; Core areas should comprise 68% of each BMU.

In contrast, the DEIS action alternatives would allow for an ORD of 34.6% across the entire BMU and ranges of 22-32% on DNRC lands, depending on the alternative. TRD levels are not reported clearly, but seem to range between 30-35.2%. The report says that Core Area will not change, remaining at 5894 acres out of a total 15,060, or 39%. A-5

If accurate, these figures suggest that DNRC is seriously out of step with the best available science and the requirements of both the ESA and Supreme Court to avoid "harm" to the habitat of listed species. It also suggests that DNRC has reneged on its commitments in the Conceptual Strategy. A-6

Finally, while we are given some very unclear figures for "habitat value" (Table II-3), the more important figures of "habitat effectiveness" for each alternative, are simply missing. A-7

2. Wolf - Virtually all of the comments made above in reference to grizzlies are similar for wolves. Wolf researcher Dave Mech and others have suggested that where Open Road Densities exceed 1 mi./sq.mi., wolves have great difficulty persisting. Yet, as noted above, nearly one third of the project area currently meets or exceeds this level. It is notable that nowhere in the DEIS do we see any commitment to lower these levels once logging is completed. A-8

The assertion on page S-15, Table II-3, that none of the action alternatives will have "discernible effects" on habitat effectiveness, prey base, or security of denning/rendezvous sites, stretches the DNRC's credibility to the breaking point. Six hundred to 700 acres of clearcuts, and up to 1226 acres of total cuts, plus all the human activity that entails, will certainly impact all of the above.

**Bull Trout & Water Quality:**
Despite the recent listing of Bull Trout as "threatened", and the likely listing of Westslope Cutthroat in the near future; neither species receives more than passing comments in the DEIS. This is a serious oversight, since Flathead Basin Commission data shows a steady decline since 1987 for bull trout redds on the North Fork, and juvenile fish in Coal Creek. The DNRC should move quickly to address this deficiency in the Final EIS. A comprehensive report due out any day from Montana Fish, Wildlife and Parks should provide useful information, but it is DNRC's obligation to minimize and mitigate impacts from this project, and past forest practices in the area. A-9

*Keeping it wild since 1958*

*Montana Wilderness Association, Northwest Field Office*
*43 Woodland Park Drive, #9 Kalispell, Montana 59901*
*406-755-6304 mwakali@desktop.org*

DNRC does not think that the SFLMP is at odds with the eight items listed in the Conceptual Strategy. Although the strategies are not specifically referenced in the SFLMP, DNRC believes that the strategies were further defined, qualified, updated, and supported by the standards presented in the SFLMP.

A-5. The above figures were cited from the Interim Motorized Access Management Direction; Northern Continental Divide Recovery Zone (IGBC, 1995). The DNRC is a member of the Interagency Grizzly Bear Committee and recognizes road management is a major factor in managing for effective grizzly bear habitat. However, the numerical guidelines only apply to Federal land management agencies; state agencies are exempted from the strict numerical targets. The DNRC's internal guidance for motorized access targets a no net gain in the proportion of each BMU sub-unit (Trust Lands only) that exceeds total or open road density thresholds. Further, the guidance encourages efforts to reduce open and/or total road density when opportunity exists.

In the DEIS, the effects of 3 Open-road Scenarios and 3 closure scenarios were displayed. These scenarios and closures may be mixed or matched resulting in a range of a 32% increase to a 22% decrease (45.7% to 27% POR) in habitat affected by open roads (DEIS page IV-34, Table IV-13). Since DNRC's commitment (Trust Lands only) targets a no net increase in the proportion of the BMU that exceeds open road densities thresholds, some combination aimed at maintaining or decreasing POR is likely to be selected.

Security area and Percent of Total Roads (PTR) in the State Coal Cyclone BMU will not be changed in response to the Cyclone/Coal Timber Harvest Project. On DNRC lands in the BMU, security areas encompass 38.3%. The PTR of 30.0% in the State Coal Cyclone BMU will be maintained. On DNRC lands, the PTR will remain at 35.2%. By maintaining the existing security area, POR, and PTR levels, the DNRC adheres to the internal guidances for these parameters and does not increase the impacts of motorized vehicle access to grizzly bear habitat.

A-6. Refer to response A-2 and A-4.

A-7. Refer to pages IV-26 through IV-42 in the DEIS for a complete discussion of impacts to wildlife and their associated habitat.

A-8. High levels of open roads and subsequent human activity may contribute to increased mortality of wolves. However, we are unaware of any local situation where this threshold has been recommended by the USFWS Recovery Coordinator or applied directly to promote wolf recovery.

Responses of recovering wolf packs to various forms of human disturbance have been mixed. Wolves in the North Fork of the Flathead River Drainage multiplied and expanded their population during the past 14 years, despite the current portion of habitat in the proposed project area exceeding the 1mi./sq.mi.-level of road density. DNRC guidance provides for suspension of operations and temporary road restrictions near active den and rendezvous sites, and for the maintenance of habitat elements that are important for meeting the life history requirements of white-tailed deer, mule deer and elk. The DNRC biologist would remain in close contact with USFWS personnel as to the whereabouts of denning wolves so that effective mitigations can be put in place, should the need arise.

On page S-15, Table II-3, we are given reassuring figures for increases in annual runoff, but are not told where the figures came from, nor how they were arrived at. Similarly, we are provided no data on anticipated increases in sediment loads, particularly the fine sediments that impact both water quality and bull trout egg survival. The Flathead Basin Commission has repeatedly noted that water quality in the Flathead Basin is deteriorating and that past forest practices have been an important contributor. There is no reason to believe that this project will not contribute in some way to that problem, since most alternatives appear to include harvest on steep slopes, and adjacent to riparian zones and previous cuts. A-10

It is significant that the 1991-92 FBC report stated, "Management activities should be restricted to those which do not increase sediment loads, particularly in Big and Coal Creeks."

**Cumulative Impacts:**
Finally, we would strongly recommend that this DEIS be modified to look at and consider the cumulative impacts of the many activities going on throughout the North Fork. One of the primary purposes of the North Fork Conceptual Strategy is to conduct planning and management in concert with other landholders on an ecosystem-wide basis. We see no evidence of this worthwhile effort in the DEIS. A-11

For example, how might this project interact with :
* Crestbrook Industries plans to log 36 mmbf just north of the border?
* Fording Coal's plans for an open pit mine in the headwaters of the Flathead?
* USFS road closures/restoration in the North Fork?
* USFS plans to move ahead on the Hornet-Wedge timber sale?
* Efforts to maintain intact movement corridors for wolves and grizzlies throughout the North Fork?
* Montana FWP efforts to restore healthy populations of bull and cutthroat trout?
* On-going subdivision and second home development on or near Coal Creek?

Once again, thank you for the opportunity to comment. We ask that you fully consider our concerns, make them part of the official record, and keep us up to date as this project unfolds.

Sincerely,

Brian Peck
for the Flathead Chapter of the Montana Wilderness Association

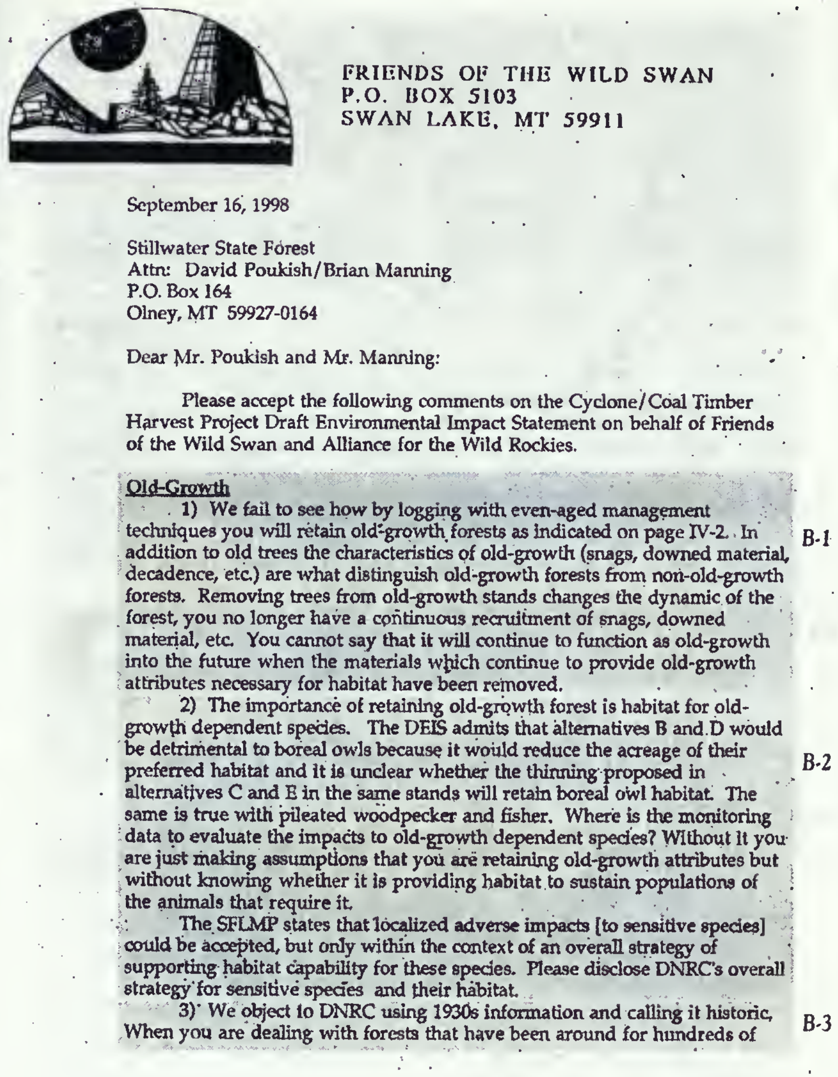
With regard to Table II-3 on page S-15 of the Draft EIS, we stand by the effects statements as written. It is not outside the realm of possibilities that a wolf den could go undetected; however, frequent communication with USFWS personnel and suspension of all project-related activities within a one-mile radius of a known, active wolf den should minimize the possibility of disturbing denning wolves. Some displacement of wolves could occur during active logging; however, temporary displacement would not be expected to reduce the productivity or survivability of local packs. Wolves could continue to roam freely through the project area following treatment, and a broader range of habitat conditions would exist following harvest. Improved foraging conditions created through proposed silvicultural treatments would potentially benefit herbivorous prey species upon which wolves depend, resulting in improved prey abundance and/or availability.

A-9. Fisheries information is found on pages III-50 - 51 and IV-50a - 50b. The text includes information on recent monitoring data, including redd counts. DNRC recognizes the need to mitigate impacts from this project and past activities. The proposed mitigation activities are discussed in the DEIS on pages IV-43 - 44 and are summarized in Appendix A.

A-10. Table II-3 is a summary of environmental effects. The detail of the analysis is contained in the text of the DEIS. The methodology for the cumulative watershed effects analysis is found on page III-49 - 50. A complete discussion of the results is found on pages IV-43 - 50. We are a cooperator in the Flathead Basin Commission's monitoring effort and contribute to their biennial report. The discussion of the effects of the proposed alternatives, including anticipated effects on sediment yields for each alternative by watershed is found on pages IV-43 - 47.

A-11. In accordance with the Administrative Rules of Montana (ARM) 36.2.522, cumulative impact means the collective impacts on the human environment of the proposed action when considered in conjunction with other past and present actions related to the proposed action by location or generic type. Related future actions must also be considered when these actions are under concurrent consideration by any *state* agency through pre-impact studies, separate impact statement evaluation, or permit processing procedures. Even though DNRC is not required by law to consider cumulative impacts of related future actions by non-state landowners, under the State Forest Land Management Plan (SFLMP), DNRC has committed to pursuing ecosystem management and other agreements with adjoining landowners to achieve mutual landscape goals. In the case of the Cyclone/Coal Timber Sale, DNRC looked at previous and concurrent Forest Service and state actions with regard to vegetation, cumulative watershed effects, effects of road densities on grizzly bears, and general cumulative impacts to wildlife species discussed in the DEIS.

Additionally, DNRC personnel have actively participated in a bi-annual Inter-local North Fork meetings with interest groups and other landowners in the North Fork regarding management of state trust lands. DNRC also participates in an annual coordination meeting with the Glacier View Ranger District. We also discussed Alternative F in the DEIS, where we would defer timber management in the project area for 2 years, during which time a wider area of analysis in the North Fork of the Flathead drainage would be performed by MDFWP and The Nature Conservancy in conjunction with DNRC to determine and analyze the full range of resource values that exist on the Coal Creek State Forest.



FRIENDS OF THE WILD SWAN
P.O. BOX 5103
SWAN LAKE, MT 59911

September 16, 1998

Stillwater State Forest
Attn: David Poukish/Brian Manning
P.O. Box 164
Olney, MT 59927-0164

Dear Mr. Poukish and Mr. Manning:

Please accept the following comments on the Cyclone/Coal Timber Harvest Project Draft Environmental Impact Statement on behalf of Friends of the Wild Swan and Alliance for the Wild Rockies.

Old-Growth

1) We fail to see how by logging with even-aged management
techniques you will retain old-growth forests as indicated on page IV-2. In B-1
addition to old trees the characteristics of old-growth (snags, downed material, decadence, etc.) are what distinguish old-growth forests from non-old-growth forests. Removing trees from old-growth stands changes the dynamic of the forest, you no longer have a continuous recruitment of snags, downed material, etc. You cannot say that it will continue to function as old-growth into the future when the materials which continue to provide old-growth attributes necessary for habitat have been removed.

2) The importance of retaining old-growth forest is habitat for old-growth dependent species. The DEIS admits that alternatives B and D would be detrimental to boreal owls because it would reduce the acreage of their
preferred habitat and it is unclear whether the thinning proposed in B-2
alternatives C and E in the same stands will retain boreal owl habitat. The same is true with pileated woodpecker and fisher. Where is the monitoring data to evaluate the impacts to old-growth dependent species? Without it you are just making assumptions that you are retaining old-growth attributes but without knowing whether it is providing habitat to sustain populations of the animals that require it.

The SFLMP states that localized adverse impacts [to sensitive species] could be accepted, but only within the context of an overall strategy of supporting habitat capability for these species. Please disclose DNRC's overall strategy for sensitive species and their habitat.

3) We object to DNRC using 1930s information and calling it historic. B-3
When you are dealing with forests that have been around for hundreds of

## B. *Friends of the Wild Swan*

B-1. On page IV-2, we state that Alternative B will harvest in a total of 678 acres of old growth; however, 218 of those acres would remain old growth, albeit with decreased amounts of some [old-growth] attributes. Additionally, we state that under Alternative C, harvesting would occur on 973 acres of old-growth stands largely by thinning from below the main canopy. The treatments would result in 931 acres of stands still being considered as old growth post harvest, but would result in decreases in some old-growth attributes. DNRC defines old growth as stands older than 150 (140 for lodgepole pine) and that exhibit a range of structural attributes associated with old age. Based on our old-growth definition and based on the treatments proposed (see Appendix D in DEIS), DNRC maintains that these stands will still meet our old-growth definition. DNRC does not feel that adequate scientific means are available to determine the function of different degrees/amounts of old-growth attributes. However, our prescriptions are designed to retain higher levels of all identified old growth attributes than has traditionally been the case. Our approach focuses on retaining all the pieces, not simply a small subset with high levels of all attributes mentioned.

B-2. Under Alternatives C and E, some question of the impacts on pileated woodpecker and boreal owl habitat existed. Based on the current knowledge of these species, the effects of these treatments are not well documented and must be inferred. Due to the uncertainty, we disclosed the lack of information and explained the inference required assessing the impacts. Wildlife monitoring strategies for DNRC projects are presently lacking. However, efforts to define monitoring needs and strategies are continuing.

Localized impacts to some sensitive species are expected to occur (DEIS pages IV-27 – IV-42). According to the SFLMP, these local impacts are acceptable in the context of an overall strategy of supporting habitat capability for these species. The overall strategy incorporates the coarse and fine filter approaches and evaluates the project in context of the landscape in the short-term and long-term. The movement of overall forest conditions toward appropriate conditions is in keeping with the SFLMP strategy.

For example, in the pileated woodpecker analysis, we realize the western larch trees will eventually die off and not be replaced without disturbance (Pages IV-38 in DEIS). However, by implementing Alternatives B or D, this trend would be accelerated, but regeneration of western larch would occur. In the context of the overall plan of maintaining sensitive species habitat, this may be an acceptable local impact.

The coarse filter approach in this case targets regeneration of more Douglas fir/western larch cover types on the landscape, while maintaining our minimum old growth retention commitment and an ample representation of other unharvested and unroaded mature forest. In the case of pileated woodpeckers, we recognize that there are current impacts associated with emulation of intensive disturbances, as well as important long-term benefits by ensuring regeneration of important seral tree species. However, we also recognize the importance of maintaining well stocked mature and old growth forest. However, in some cases, certain habitats conditions may be reduced to enhance others. Still, we expect that retention of snags, large live trees as snag recruits, large live cull trees, and coarse woody debris will provide nesting and feeding habitat for pileated woodpeckers, as well as other old-growth associated species.

years a mere 60 years in the past does not necessarily represent historic conditions.

4) Your arbitrary *few, some, many* indicators of old-growth attributes are meaningless. How many is few? some? many? If you are going to discuss old-growth attributes in terms of how many snags, down material, etc. are in a stand you must quantify it based on current science. What size are the snags, down materials (diameter and length)? What species are they? How many are there? How much decay is in the stand? B-4

5) The old-growth map on page III-4 does not contain a key and a HW type was not listed on the previous pie chart. It is also difficult to distinguish between the colors. What can be said though is that the old-growth (at least by DNRC delineation) for the most part is fragmented and chopped up. DNRC has still not addressed which old-growth stands will be retained for the long-term, how the old-growth will be linked together, size of old-growth patches, value to various old-growth dependent species, potential/replacement old-growth in relation to existing old-growth, historic old-growth levels, etc. What is your long-term plan for achieving this? B-5

6) Please respond to our comments of October 3, 1997 regarding the individual units. B-6

7) We did not see any analysis of the effects of blowdown on old-growth stands adjacent to the stands you propose to "manage". B-7

Fisheries/Water Quality

1) As I indicated to you last week Table III-20 is identical to Table III-19. B-8

2) Your narrative on page III-51 fails to state that the fine sediment in Coal Creek has been on the rise and had increased from 32.6% to 38.2% between FY 1995 and FY 1997. Fry emergence success for bull trout and westslope cutthroat trout decreases to 26% at 40% fines and is only 34% at 30% fines (Flathead Basin Forest Practices Water Quality and Fisheries Cooperative Program Final Report, June, 1991). Bull trout are a "threatened" species under the Endangered Species Act, westslope cutthroat are petitioned for listing under the ESA, Coal Creek is a water quality limited stream segment, fine sediment in Coal Creek is limiting bull trout and westslope cutthroat trout reproductive success and there are numerous sediment sources that DNRC will not fix without a timber sale. On top of this DNRC appears to be refusing to even consider developing a Total Maximum Daily Load for Coal Creek. At what point will the state take responsibility for past actions and work towards cleaning up our waters and recovering our beleaguered native fish? B-9

General watershed standard #1 states: DNRC would manage watersheds, soil resources, and streams, lakes, wetlands, and other bodies of water to maintain high quality water that meets or exceeds state water quality standards and to protect designated beneficial uses. (emphasis added) How is DNRC complying with this standard if you are not working towards development of a TMDL and beneficial uses (i.e., bull trout and westslope

B-3. In the SFLMP (ROD-12), we state that on "areas of large, blocked ownership, we would manage for a desired future condition characterized by the proportion and distribution of forest types and structures historically present on the landscape." In order to manage for a desired future condition characterized by historic conditions, it was necessary for DNRC to adopt a baseline for historic conditions. Losensky (1997) provided this historic baseline in his report *Historical Vegetation of Montana*. According to Losensky (1997), quantifiable information was not available before or at the time of settlement. The first vegetation surveys that provided systematic samples that could be evaluated statistically and permitted an evaluation of vegetation cover and structure of the forest environment occurred in the 1930s. The 1930s data provide a reference point that may be used to evaluate changes over time that are the result of management practices or control of natural processes. Losensky (1997) has chosen to define "natural" vegetation as vegetation present at the time that significant numbers of Euro-Americans settled the area. DNRC has chosen to use the term historic to represent the vegetation condition present at the time of settlement.

B-4. The Appendix in which the terms 'none, few, some, and many' were quantified was inadvertently omitted from the DEIS. It is included in the FEIS. Although the terms appear to suggest an arbitrary or subjective categorization, such is not the case. Rather, each term was applied using the objective criteria shown in the Appendix. We prefer to retain the rather loose terminology, however, because the raw data upon which they were based were themselves obtained via stand walk-through exams (i.e., visual estimates), rather than plots in which each old-growth attribute was sampled and enumerated.

The following range of characteristics were used to compile the different indices:

Snag Index:
MANY = 4 or more 21"+ snags/acre or 7 or more 15-21" snags/acre
SOME = 1 to 3, 21"+ snags/acre or 4 to 6, 15-21"+ snags/acre
FEW = No 21"+ snags/acre, but 1 to 3, 15-21" snags/acre
NONE = No (or < 1/acre) snags larger than 15" dbh.

Coarse Woody Debris Index:
MUCH = Some logs of 31"+; or 2 or more logs of 26 to 30"; or 4 or more logs of 21 to 25" or more logs per transect, or Down Woody Large 6 or greater.
SOME = No logs of 31"+, but 1 or more logs of 26 to 30", or 2 or more logs of 21 to 25" per transect, or Down Woody Large of 4 or greater.
FEW = No logs of 26"+, but 1 or more logs of 21 to 25", or 1 or more logs of 16 to 20", or Down Woody Large of 1 or greater.
NONE = No logs of 16" or greater, or Down Woody Large = 0

Large Tree Index:
MANY = 11 or more 21"+ trees/acre
SOME = 6 to 10, 21"+ trees/acre
FEW = 1 to 5, 21"+ trees/acre
NONE = No trees larger than 21" dbh.

Decadence Index (see pp. III-18-21 in DEIS for a discussion of stand vigor/decadence):
MUCH = Very poor vigor, vigor rating of 4
SOME = Fair-to-poor vigor, vigor rating of 3
LITTLE = Good-to-fair vigor, vigor rating of 2
NONE = Full vigor, vigor rating of 1

cutthroat trout) are continuing to be negatively impacted from roads and past activities? B-9

3) There is no cumulative effects analysis for fisheries. B-10

4) Please disclose the Watershed Analysis that was conducted to conclude that an approximate 150 foot buffer is adequate to protect fish. Even the Forest Service's INFISH has a default buffer of 300 feet in the absence of detailed watershed analysis. B-11

5) Please disclose how Coal Creek, a core bull trout area designated by the Montana Bull Trout Restoration Team Science Group, is being stringently protected. B-12

__Grizzly Bear__ B-13

1) It appears that the Coal Creek State Forest has high total and open road densities. DNRC agreed, in the Swan Valley Grizzly Bear Conservation Agreement, to limit open road densities of one mile per square mile to no more than 21% of a BMU subunit. It appears that for the most part the open road scenarios in Table IV-13 for this project will increase. Why won't DNRC reduce its road densities on the Coal Creek State Forest?

2) We found the Habitat Value Influenced by Motorized Activity section on page IV-35 to be confusing. Please re-write this section so it can be understood by the general public. B-14

__Range of Alternatives__ B-15

1) Essentially all action alternatives (B,C,D and E) have the same cutting units (with the exception of removing Unit 1 from alternatives B and D) and very little volume range differential (between 8.9 and 10.6 mmbf).

2) All alternatives fragment old-growth habitat.

3) All alternatives have cutting units along Coal Creek.

We fail to see how this constitutes a range of alternatives as required by MEPA.

__Response/Consideration of Prior Comments__ B-16.

1) We have submitted extensive comments during the development of this project as well as on the field tour, yet for the most part our comments have not been given any response or consideration in the DEIS. Please respond to these as well as our prior comments.

__General Comment__ B-17

1) None of your alternative maps reveal where the helicopter landings will be located or how much timber will be removed to construct them. Please disclose this information.

2) Please disclose the volume, by species and diameter, for each alternative. Please disclose what species of trees are contained in the mixed conifer classification and how much of each species will be cut for each alternative. B-18

B-5. We apologize for the colors of the cover types being too similar in shading and we will make sure a more definable and legible color schematic for this map will be utilized in the final EIS . Our stand level inventory indicates that there are no hardwood (HW) cover type classes on the Coal Creek State Forest (CCSF).

Old-growth stands on the CCSF will be analyzed at the project level as future projects are proposed. The old-growth analysis in the Cyclone Coal DEIS provides information that you request on old growth: how old growth is linked together, size of old-growth patches, impacts of harvest treatments to old-growth associated wildlife species, and historic old-growth levels.

B-6. See response to B-16.

B-7. The reduction of stand density in the harvest areas for Alternatives C and E will increase the risk of windthrow. The risk of windthrow can be reduced by retaining trees that are more windfirm, such as western larch and Douglas-fir, and locating leave trees in areas that are less exposed to wind. Silviculture prescriptions utilized in this project will reduce the risk of windthrow. We do expect windthrow to occur in the stands adjacent to units being treated with the Clear-Cut with Reserves, with some areas of additional Shelterwood retention (CCR/SH), and in units being treated with the Clear-Cut with Reserves with some additional Seedtree with Reserves retention (CCR/STR). This will be due to the opening of the crown canopy and lowering of the stand densities within these treated units. Although an increase in windthrow was expected in all alternatives, it was considered in our effects analysis and considered during project design. Additionally, some amount of windthrow will increase old-growth attribute levels.

B-8. Please replace Table III-19 and Table III-20 in the DEIS with the tables found on page 6 in the FEIS Errata.

B-9. Long-term monitoring of Coal creek fish populations and habitat show highly variable results with no identifiable trends pointing toward management activities. McNeil cores gathered since 1981 have a mean value of 37.1% with a standard deviation of 2.7%, and range from a high of 42.1% to a low of 32.6%. The values obtained in recent years as reported in the DEIS remain within or below one standard deviation of the mean. Substrate scoring has been conducted on Coal creek since 1983 by DFWP. Substrate scores range from a low of 9.6 to a high of 12.3. The mean score since 1983 is 10.5 with a standard deviation of 0.6. Substrate scores recorded in recent years as reported in the DEIS are at or above the mean value. Spawning sites have been observed for bull trout since 1979 in Coal creek. The mean number of redds through this period is 30, with a standard deviation of 20, maximum of 61, and minimum of 3. Redd counts in recent years have been below the mean, and in some cases outside of one standard deviation from the mean. The reason for the below average spawning sites is not known, and has not been traced to any event or series of events by DFWP biologists or other land managers.

Intergravel sediment can vary considerably based on the level and duration of streamflow, movement of sediment caused by deterioration of natural sediment barriers, such as downed logs, that trap and store sediment in the stream channel, and other natural factors. DNRC does not feel that the data represents a trend nor are the results directly attributable to management activities. However, regardless of the source, DNRC recognizes that the high intergravel sediment levels are a cause for concern. As a result, DNRC has designed our activities in accordance with the Flathead Basin Forest Practices Water Quality and Fisheries Cooperative Program recommendations for bull trout streams

3) Please disclose how many of the cutting units are on slopes greater than 50%. B-19

4) We find it disingenuous for DNRC to portray a clearcut as mimicing a hot, stand replacing fire. Fire is beneficial to the land and leaves the burned trees and biomass on site, clearcutting runs machines over the soil and removes the biomass. There is a distinct difference. B-20

Similarly on page IV-26 you state that "natural disturbance" in such a stand would remove all the stems, rather than simply thin them. Natural disturbance would not "remove" stems from site but merely burn them and leave them to enrich the soil, provide down material and snags. B-21

Economics B-22

1) Why if stumpage prices have fallen 25% and DNRC has received only 1 bid on the last 2 timber sales offered by the Stillwater State Forest are you proceeding with more timber sales? How does selling timber at a low cost benefit the school trust?

We expect our comments to be given full consideration. Thank you.

Sincerely,

Arlene Montgomery

Arlene Montgomery
Friends of the Wild Swan
for
Katie Deuel
Alliance for the Wild Rockies

in a Athreatened@ status (greater than 35% fines).

DNRC plans extensive watershed rehabilitation work with the action alternatives of this proposed project. The proposed mitigation activities are discussed in the DEIS on pages IV-43 - 44 and are summarized in Appendix A. These mitigations are funded through the timber sale. Adequate funds are not available outside of the sale program to complete extensive rehabilitation efforts. Without a timber sale existing maintenance funds would be used to remedy some of the highest priority sites.

DNRC is complying with all pertinent laws related to water quality. Development of Total Maximum Daily Loads (TMDLs) is the responsibility of the Department of Environmental Quality (75-5-703 (1) MCA). We cooperate with DEQ in these efforts, such as with the Flathead Lake TMDL. In absence of a TMDL, our activities are conducted in accordance with all reasonable land, soil, and water conservation practices, as prescribed in 75-5-703(10) (c). In addition, we will monitor implementation and effectiveness of mitigations and other protective measures through contract administration and BMP reviews. DNRC will continue to work with DFWP on cooperative fish habitat monitoring efforts for Coal Creek and Cyclone Creek as noted in the DEIS.

B-10. The effects on fisheries are discussed on page IV-50a. As mentioned in your letter and as recognized in the DEIS, high sediment values are a limiting factor for fisheries. The cumulative impacts of the proposed alternatives on sedimentation is contained in the watershed section of the effects assessment. This analysis indicates that these activities would lead to short-term increases in sedimentation during construction. The short-term increases may lead to deposition of fine sediment in spawning and rearing areas. As sites revegetate and stabilize, there would probably be a long-term benefit to fish habitat by the elimination of long-term and chronic sources of sediment. The impacts to fish habitat will correlate directly with the findings on sedimentation.

B-11. Analysis of the prescribed streamside buffers is based on the slope, soil erodibility, and vegetative cover of the land adjacent to the stream. It is the opinion of the resource professionals that evaluated the project that 150 feet provides protection from any potential adverse effects associated with this proposed timber sale. This opinion is supported by sediment transport literature, such as Burroughs and King's 1989 report titled, "Reduction of Soil Erosion on Forest Roads", USDA-FS General Technical Report INT-264.

B-12. Coal Creek is being protected through location of sale units in relation to stream channels, exclusion of harvest activity in the SMZs, and extensive mitigations being applied to the road system. A summary of the mitigations is contained in Appendix A.

B-13. The Swan Agreement does not apply to the Coal Creek State Forest. However, if it did apply, the current management of open roads in this BMU (34.6%) would be close to the minimum allowable POR (33%) under that agreement. The long-term *goal* of the Swan Agreement specifies 21% POR. DNRC's internal guidance applicable to the Coal Creek State Forest requires that DNRC maintain a no net increase in POR and make efforts to reduce open road density when opportunity exists. Therefore, an increase in road densities is not expected and the possibility to decrease POR exists. Refer to page 20 (Grizzly Bear) in the FEIS errata for a discussion of total and open road densities.

B-14. The habitat value influenced by motor vehicle activity (HVIMVA) section received several comments on clarity and information. This chart details the influence of each Open-road scenario and road closure on seasonal grizzly bear habitat. The existing condition is represented by 1.00. To calculate the effects of an Open-road scenario or any combination of Open-road scenarios and closures, add the numbers in the appropriate cell to the existing condition. An increase from 1.00 reflects a decrease in grizzly bear habitat effectiveness. A decrease from 1.00 an increase in grizzly bear habitat effectiveness. In the decision process, the decision-maker will choose 2 Open-road scenarios (either 1 and 3 or 2 and 3), which may be incorporated together or separately and any combination of closures, ranging from none to all 3 closures. To determine the effects of these decisions, the table below provides an index to seasonal habitat by Open-road scenarios and closures. Open-road scenario 1 or 2 will be used to access Unit 2, while Open-road scenario 3 will be used to access Unit 5.

For example, assume Units 2 and 5 will be harvested the same spring. Open-road scenario 1 or 2 would be used to access Unit 2, while Open-road scenario 3 would be used to access Unit 5. Assume Open-road scenario 1 will be used to access Unit 2. In this case, the HVIMVA in spring would increase from 1.00 (existing condition) to 1.47 (1.00 (existing condition) + 0.26 + 0.21 = 1.47), an increase of 47%. This is an impact to grizzly bear spring habitat. However, an increase may be mitigated by instituting 1 or more road closures. In this example, if Road closures 'A', 'B', and 'D' were added during the spring, the cumulative effects would sum to 1.20 (1.00 + 0.26 + 0.21 + (-0.14) + (-0.06) + (-0.07) = 1.20). In this situation, an increase in HVIMVA could not be offset and a decrease grizzly bear spring habitat would occur.

These steps hold true for any combination in any season. One combination in a season may occur, while another combination in another season may occur. For example, Unit 2 may be harvested in spring with Open-road scenario 2 and closures 'A', 'B', and 'D', resulting in a decrease in HVIMVA to 0.82 (18% decrease) or a net gain in spring grizzly bear habitat. While in summer, Unit 5 may be harvested using Open-road scenario 3 and no closures, resulting in an increase in HVIMVA to 1.23 (23% increase) or a net decrease in grizzly bear summer habitat.

| Scenario | Spring | Summer | Autumn |
|---|---|---|---|
| Current (Existing Condition) | 1.00 | 1.00 | 1.00 |
| **Opening Currently Gated Roads to Mechanized Equipment *(habitat loss)*** | | | |
| *Open-road Scenario 1* | 0.26 | 0.25 | 0.24 |
| Open-road Scenario 2 | 0.09 | 0.08 | 0.08 |
| Open-road Scenario 3 | 0.21 | 0.23 | 0.23 |
| **Closing Currently Open Roads with Newly Installed Gates *(habitat gain)*** | | | |
| Closure 'A' | (-0.14) | (-0.14) | (-0.14) |
| Closure 'B' | (-0.06) | (-0.08) | (-0.09) |
| Closure 'D' | (-0.07) | (-0.07) | (-0.08) |

* Closure 'C' was excluded because it did not change the HVIMVA either way.

B-15. While all action alternatives have similar cutting units, Alternatives B and D employ different silvicultural treatments and achieve different objectives than do Alternatives C and E. Additionally, DNRC developed a deferral Alternative F, which would defer timber harvest for two years, during which time a broader analysis would be performed. Please refer to pages II-1 through II-4 in the DEIS for a discussion of rationale for developing all six alternatives. Also, as we discussed in Newsletter Vol. I, No. 2, September 1997, areas were identified using a coarse filter approach. Vegitative analysis indicated that Larch/Douglas-fir cover types were deficient in the Coal Creek State Forest while Mixed conifer and Subalpine fir types were in excess. The project goal was to move the forest towards a more appropriate condition following the guidance in the State Forest Land Management Plan. This meant that since we identified stands that are not in an appropriate condition using the existing environment, the location of these stands would not change between alternatives, if we were to maintain the project goals. However, how we manipulate these stands to move them towards a more appropriate condition could be different. As the project developed and more input was accumulated for this project, through field tours, newsletters, and personal contacts a more descriptive discussion was presented in Newsletter Vol. 1, No. 3, December 1997. Here we applied fine filters to the project area to address specific issues raised internally and by the public. These fine filters created two very different alternatives for this project.

In the only stand along Coal and Cyclone Creeks (portion of unit 7) there will be a minimum of a 50 meter buffer, which follows the fisher guidance found in the State Forest Land Management Plan Implementation Guidance. Most of the unit identified for treatment in this area is located more than 175 feet from the stream.

The Administrative Rules of Montana (ARM 36.2.529 (5) require "an analysis of reasonable alternatives to the proposed action, including the alternative of no action and other reasonable alternatives...." Accordingly, the ARM 36.2.522 (2)(b) require the agency "to consider only alternatives that are realistic, technologically available, and that represent a course of action that bears a logical relationship to the proposal being evaluated." We feel that through the alternative development process we have addressed the concerns of the public and have developed alternatives that meet the tenets of the State Forest Land Management Plan (SFLMP).

B-16. Your previous comments were submitted as part of the public involvement component of the alternative development process and were identified as such in Newsletter Vol. I, No. 3, under *Alternatives*, and Newsletter Vol. I, No. 4, under *Alternative Development*. . As such, your comments were addressed through development of Alternatives B, C, D, E, and F, and most of your comments have been analyzed as part of the DEIS. Some of your more recent comments regarding the DEIS, repeated your comments from earlier field tours and newsletters, and therefore will be responded to as part of the FEIS. One comment, regarding grazing, was not addressed in the DEIS or previous newsletters and will be answered here.

**16a. Impacts from grazing from the adjacent private landowner who also has a grazing allotment on adjacent forest service land. Rehabilitation work done by Fish, Wildlife and Parks has been damaged due to grazing, these cows apparently run all over private and forest service land. If you open this area up will there be additional impacts to state lands from cows for which you have no enforcement personnel? Who will pay for restoration, fencing, etc.?**

B-16a. We don't anticipate additional impacts from grazing by implementing this timber sale due to proximity of cutting units to existing grazing leases, wooded buffers, and excessive slopes.

Please note, however, that in accordance with the SFLMP and Grazing Resource Management

Standards 4 and 7(d), livestock management practices on ***state classified forest lands*** would be designed to prevent unacceptable loss of streambank vegetation and structural damage to streambanks that results in nonpoint source pollution. Additionally, ***[state]*** areas that showed resource damage greater than the prescribed limits would be mitigated or rehabilitated by the lessee, with technical assistance from DNRC. If improved management did not resolve the damage, adjustments in the license or lease would be used to facilitate rehabilitation efforts.

B-17. Helicopter landing areas, number and size will be kept to a minimum for this project. Landings will be located in existing openings from previous harvest activities and wide openings along roads. Landings from previous harvests will be used when possible. Service landings will be located in areas to protect water quality. A spill plan for fuel containment that meets Haz/Mat Specifications will be required.

Little to no volume will be removed from landing areas in this project. The specific location of landings will not be designated until contractors review and bid on project. The above specifications will be included in the bid package from contractors.

B-18. The following table contains estimates of the harvest volume percentage by species groups that DNRC estimated that would be harvested for alternative B, C, D and E. The WL/DF contains Western Larch and Douglas fir. The WW & other contain all other species group other than WL and DF.

**The Estimated Harvest Percentages by Species Group and Alternative**

| | **Alternative B** | **Alternative C** | **Alternative D** | **Alternative E** |
|---|---|---|---|---|
| WL/DF | 55.2% | 49.2% | 52.4% | 46.6% |
| WW & Other | 44.8% | 50.8% | 47.6% | 53.4% |
| | 100.0% | 100.0% | 100.0% | 100.0% |

The following table contains estimates of the average DBH for the harvested volume by Alternative.

**The Estimated Harvest Average DBH by Alternative**

| | **Alternative B** | **Alternative C** | **Alternative D** | **Alternative E** |
|---|---|---|---|---|
| DBH | 20.3 | 15.3 | 20.3 | 15.3 |

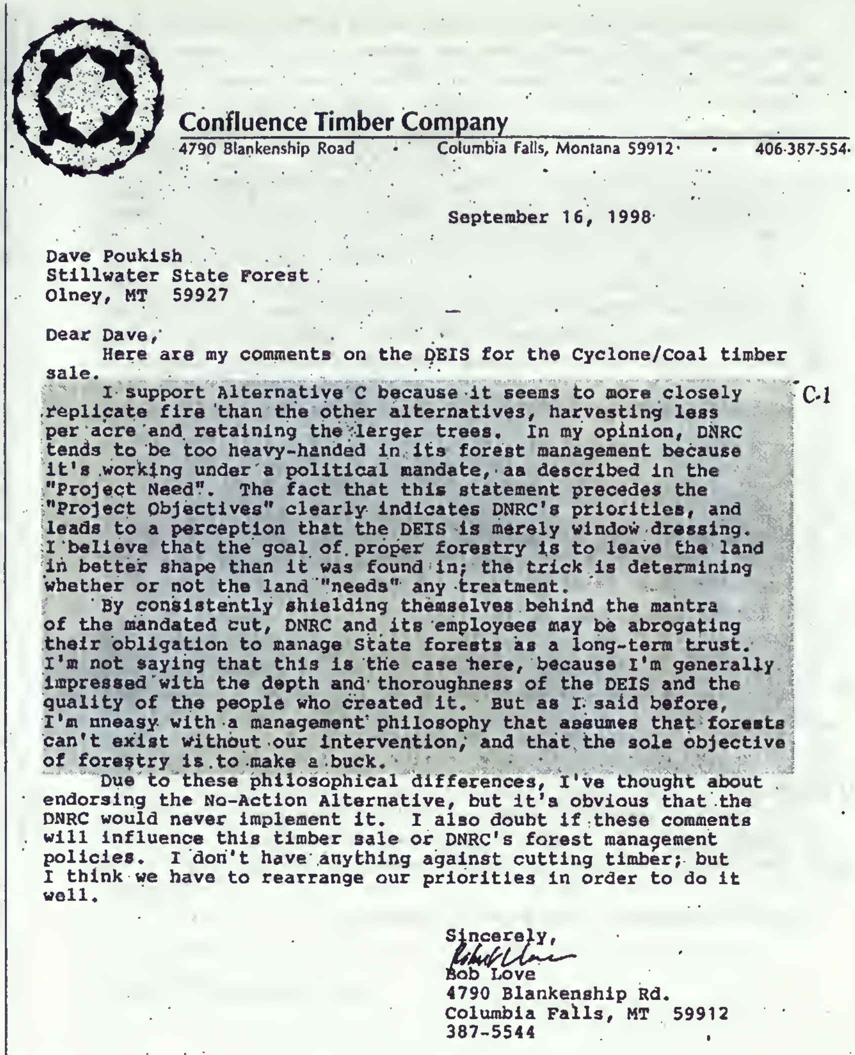
* *See attached databases in Appendix A from the current Stand Level Inventory for estimates of the current condition, including composition of the mixed conifer cover type class.*

B-19. Units 1, 3 and portions of 2 and 5 have slopes greater than 50%. Slope, soils and equipment restrictions have been included in our effects analysis and are discussed in the DEIS, Mitigation Measures Common To All Timber- Harvesting Alternatives, IV-22.

B-20. We agree that a clearcut does not mimic a hot, stand replacing fire. We instead prefer to say that a clearcut emulates a hot, stand replacing fire. Emulate, as defined by Webster, means "to strive to equal." We specifically chose to use the term emulate throughout the DEIS, because we think that it more aptly describes how timber harvest and natural disturbances are linked together. Ways in which a clearcut emulates fire include: retention of a relatively undisturbed root zone, with fine roots serving to maintain soil stability and provide organic matter directly to the soil; removal of a large proportion of the evapotranspiring surfaces; stimulation of understory sprouting and growth; and exposure of mineral soil. Ways in which a clearcut does not closely emulate fire include: a reduction in dead shade; removal of a high proportion of tree stems; and removal of less of the existing down coarse woody debris. Both timber harvest and fire reduce shade and remove foliage (which influences rates of evapotranspiration), maintain stumps and root mass, and maintain soil stability. Any occurrence of the term "mimic" in the DEIS is an error, and will be changed in the FEIS.

B-21. We agree with your statement. Use of the term remove may not be as accurate as to say that a natural disturbance would burn or cause mortality to all of the stems. This will also be reflected in the FEIS.

B-22. The most recent timber sale from the Stillwater State Forest, Stewart-Butcher Timber Sale September 3,1998, DNRC received three bids. DNRC's current annual timber sale requirement is based on Montana Law, annual sustainable yield as timber sale requirement – review 77-5-223, MCA. An annual sustainable yield level of 42.6 million board feet was estimated in accordance with 77-5-222, MCA (Determination of annual sustainable yield).



**Confluence Timber Company**
4790 Blankenship Road • Columbia Falls, Montana 59912 • 406-387-554

September 16, 1998

Dave Poukish
Stillwater State Forest
Olney, MT 59927

Dear Dave,

Here are my comments on the DEIS for the Cyclone/Coal timber sale.

C-1 I support Alternative C because it seems to more closely replicate fire than the other alternatives, harvesting less per acre and retaining the larger trees. In my opinion, DNRC tends to be too heavy-handed in its forest management because it's working under a political mandate, as described in the "Project Need". The fact that this statement precedes the "Project Objectives" clearly indicates DNRC's priorities, and leads to a perception that the DEIS is merely window dressing. I believe that the goal of proper forestry is to leave the land in better shape than it was found in; the trick is determining whether or not the land "needs" any treatment.

By consistently shielding themselves behind the mantra of the mandated cut, DNRC and its employees may be abrogating their obligation to manage State forests as a long-term trust. I'm not saying that this is the case here, because I'm generally impressed with the depth and thoroughness of the DEIS and the quality of the people who created it. But as I said before, I'm uneasy with a management philosophy that assumes that forests can't exist without our intervention, and that the sole objective of forestry is to make a buck.

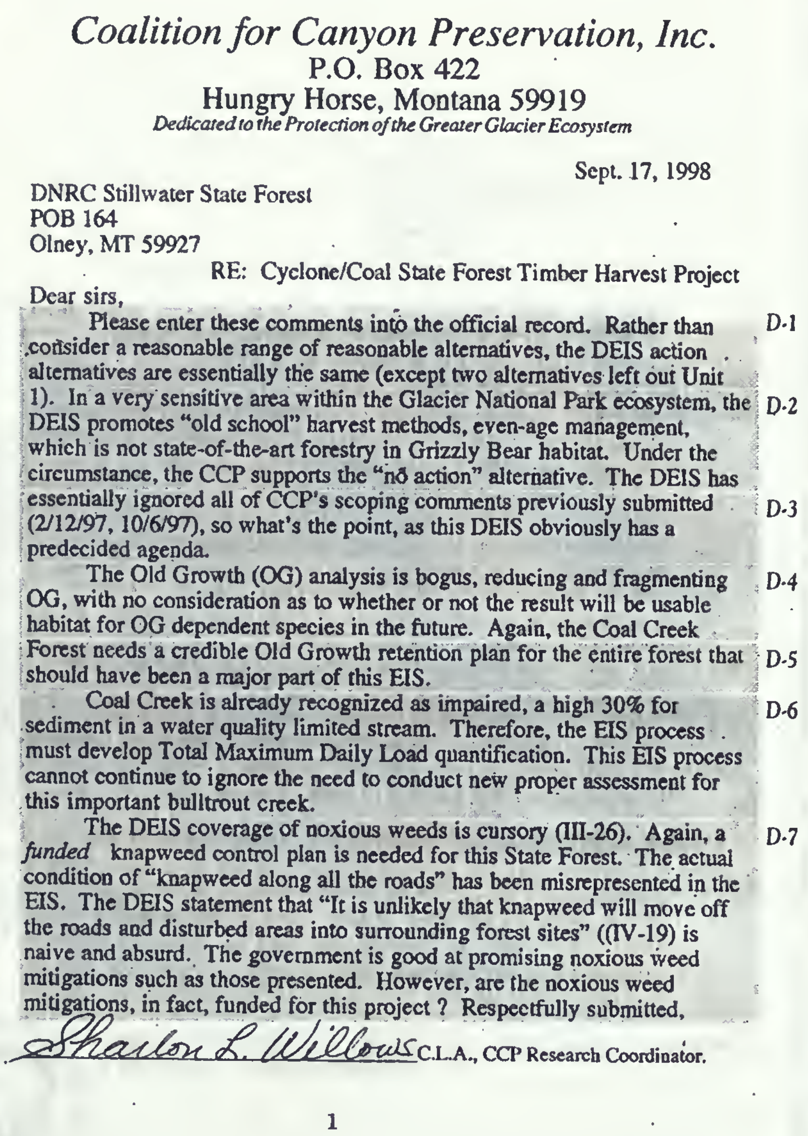
Due to these philosophical differences, I've thought about endorsing the No-Action Alternative, but it's obvious that the DNRC would never implement it. I also doubt if these comments will influence this timber sale or DNRC's forest management policies. I don't have anything against cutting timber; but I think we have to rearrange our priorities in order to do it well.

Sincerely,
Bob Love
4790 Blankenship Rd.
Columbia Falls, MT 59912
387-5544

## C. *Confluence Timber Company*

C-1. In all federal and state EISs, the Project Need precedes the Project Objectives. The Project Need describes why the state is undertaking the proposed action. The "need" is the foundation for the writing of specific objectives that describe what the State of Montana wants to achieve. Further, the "need" for the actions gives rise to proposed ways (alternatives) to fill that need. According to Shipley Environmental (NEPA consulting firm), agencies should place the "need" statement in the EIS or EA directly after a brief description of the proposed action and before the project objectives. The Project Need should not lead to the perception that the DEIS is merely window dressing. Please review the discussion of alternative development on pages II-1 through II-IV to understand how the project need and objectives were reflected in different alternatives.

Your second comment states that you are uneasy with a management philosophy that assumes that forests can't exist without our intervention, and that the sole objective of forestry is to make a buck. DNRC believes that without sound management of state forests, shade tolerant tree species will continue to encroach due to fire suppression, and that historical forest conditions will cease to exist without our intervention. As part of our trust mandate (which is required by law and has been upheld by judicial review), DNRC is required to produce the largest measure of reasonable and legitimate return to the trust in the long run. DNRC has dual objectives of generating revenue for the school trust as well as implementing the State Forest Land Management Plan (SFLMP), which entails managing the forests for a desired future condition or appropriate condition, characterized by the proportion and distribution of forest types and structures historically present on the landscape. The SFLMP represents our adopted philosophy regarding the best way to ensure short and long term revenue streams to the trusts.



*Coalition for Canyon Preservation, Inc.*
P.O. Box 422
Hungry Horse, Montana 59919
*Dedicated to the Protection of the Greater Glacier Ecosystem*

Sept. 17, 1998

DNRC Stillwater State Forest
POB 164
Olney, MT 59927

RE: Cyclone/Coal State Forest Timber Harvest Project

Dear sirs,

Please enter these comments into the official record. Rather than D-1
consider a reasonable range of reasonable alternatives, the DEIS action
alternatives are essentially the same (except two alternatives left out Unit
1). In a very sensitive area within the Glacier National Park ecosystem, the D-2
DEIS promotes "old school" harvest methods, even-age management,
which is not state-of-the-art forestry in Grizzly Bear habitat. Under the
circumstance, the CCP supports the "no action" alternative. The DEIS has
essentially ignored all of CCP's scoping comments previously submitted D-3
(2/12/97, 10/6/97), so what's the point, as this DEIS obviously has a
predecided agenda.

The Old Growth (OG) analysis is bogus, reducing and fragmenting D-4
OG, with no consideration as to whether or not the result will be usable
habitat for OG dependent species in the future. Again, the Coal Creek
Forest needs a credible Old Growth retention plan for the entire forest that D-5
should have been a major part of this EIS.

Coal Creek is already recognized as impaired, a high 30% for D-6
sediment in a water quality limited stream. Therefore, the EIS process
must develop Total Maximum Daily Load quantification. This EIS process
cannot continue to ignore the need to conduct new proper assessment for
this important bulltrout creek.

The DEIS coverage of noxious weeds is cursory (III-26). Again, a D-7
*funded* knapweed control plan is needed for this State Forest. The actual
condition of "knapweed along all the roads" has been misrepresented in the
EIS. The DEIS statement that "It is unlikely that knapweed will move off
the roads and disturbed areas into surrounding forest sites" ((IV-19) is
naive and absurd. The government is good at promising noxious weed
mitigations such as those presented. However, are the noxious weed
mitigations, in fact, funded for this project ? Respectfully submitted,

Sharlon L. Willows C.L.A., CCP Research Coordinator.

## D. Coalition for Canyon Preservation, Inc.

D-1. Please refer to response to B-15.

D-2. Many stands were identified for treatment using the coarse filter approach during project development. Some of these stands were identified as having important qualities in their present conditions and were left untreated within this project area. Effects to wildlife within the project area, by maintaining these stands in their existing condition, was considered and discussed on (pages IV-24 and IV-25 in DEIS). The areas eliminated from further consideration were based on a variety of rational, including wildlife-related issues, ecosystem integrity and/or landscape heterogeneity, sensitive soils, and economic concerns. The silviculture treatments discussed in the DEIS are DNRC's best attempt to emulate natural disturbances that would be expected to influence the landscape located in Coal Creek State Forest. The definitions used to describe the treatments in this document were taken from the, Society Of American Foresters, SILVICULTURE WORKING GROUP NEWSLETTER (D-2). This document describes and defines, methods that have been modified to describe the possibility of retaining reserve trees that may be desired to attain particular management objectives, and re-defining Silviculture to reflect its current scope. Even-aged stands make up a large proportion of the forests in Montana, including the CCSF, and other grizzly bear habitat.

For more discussion on grizzly bear habitat impacts, please refer to response A-5.

D-3. Your previous comments were submitted as part of the public involvement component of the alternative development process and were identified as such in Newsletter Vol. 1, No. 3, under *Alternatives*, and Newsletter Vol. 1, No. 4, under *Alternative Development*.. As such, your comments were addressed through development of Alternatives B, C, D, E, and F and most of your comments have been analyzed as part of the DEIS. Some of your more recent comments regarding the DEIS, repeated your comments from earlier field tours and newsletters, and therefore will be responded to as part of the FEIS. One comment, regarding Tom Power's economic analysis of the State Forest Land Management Plan (SFLMP), was not addressed in the DEIS and will be answered here.

**3a. Recognized insufficiencies in the SFLMP [identified in Tom Power's paper, *Montana's State Forests, Schools and Quality of Life*] must be addressed in the EIS.**

D-3a. DNRC is aware of Tom Power's economic analysis of Montana's State Forests. In summary, DNRC realizes that recreational opportunity can equate to revenue being generated from state trust lands; however, for FY 1997, Recreational Use Licenses ($10 per license) generated only $109,376 for the trust compared to $5.76 million generated from timber sales. Additionally, DNRC does not believe that timber management will preclude or limit future recreational opportunities in the area. Finally, DNRC believes that timber management on state trust lands (< 3% of forested land in Montana) will have negligible impacts on current and future population growth and any subsequent economic expansion of the state of Montana. According to McCool and Haynes (1996), population growth rates in Western Montana are expected to increase over 40 percent within the next 20 years with or without timber harvesting. An economic analysis of our management direction can be found in our State Forest Land Management Plan.

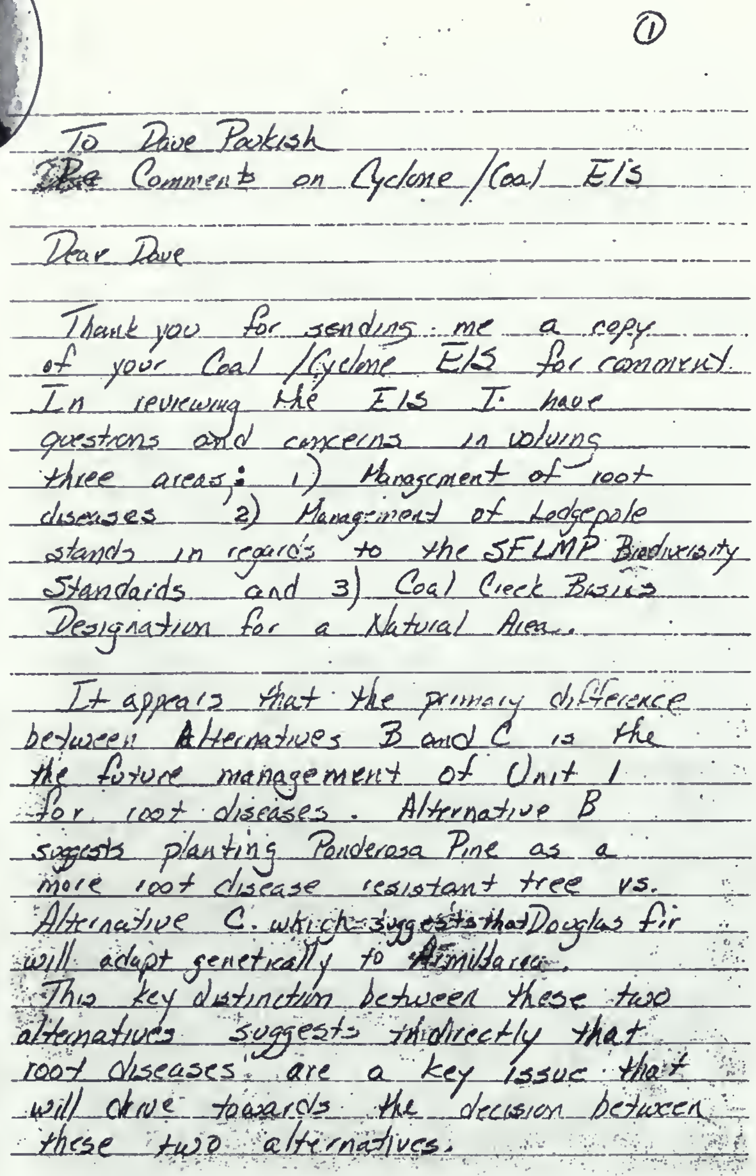
D-4. We stand by the analysis that was produced in the DEIS. We believe that the expected effects of the various proposed treatments related to old growth and associated species were considered and disclosed in the document. In the DEIS we have analyzed the impacts to old-growth attributes (identified in our stand level inventory) resulting from various silvicultural treatments. Additionally in the DEIS, we have analyzed the impact of implementing various silvicultural treatments on multiple resources, including: wildlife (T & E species and sensitive species, which includes old-growth-associated species), water, soils, fisheries, visual characteristics, and economics. Please refer to the discussion under responses B-1 and B-4 for more detail.

The contention that timber harvest (clearcutting) is detrimental to grizzly bears is questionable. Historically, wildfire altered grizzly bear habitat. In the absence of fire, timber harvests modify this habitat. Waller (1992) reported grizzly bears used harvested stands less than expected if they were under 10 years old and more than expected in they were between 30-40 years old. Otherwise, use of the harvested units did not significantly differ from its availability. All the stands in his study area were accessible by motor vehicle, thereby confounding the results of timber harvests. In Mace and Waller (1997), grizzly bear used cutting units in proportion to their availability in their home range. Zager et al. (1983) reported radio collared grizzly bears avoided clearcuts, however, they observed "substantial use of certain logging units" during on-the-ground investigations. These data raise many questions on the effects of timber harvests on grizzly bears.

D-5. Old-growth stands on the CCSF will be analyzed at the project level as future projects are proposed. The old-growth analysis in the Cyclone Coal DEIS provides information on how old growth is linked together, size of old-growth patches, impacts of harvest treatments to wildlife species in old growth, and historic old-growth levels. Additionally, the analyses completed show that we will retain approximately twice as many acres of old growth than we have committed to retaining in the SFLMP.

D-6. Development of Total Maximum Daily Loads (TMDL) is the responsibility of the Department of Environmental Quality (75-5-703 (1) MCA). We cooperate with DEQ in these efforts, such as with the Flathead Lake TMDL. In absence of a TMDL, our activities are conducted in accordance with all reasonable land, soil, and water conservation practices, as prescribed in 75-5-703(10)(c) MCA. In addition, we will monitor implementation and effectiveness of mitigations and other protective measures through contract administration and BMP reviews. DNRC will continue to work with DFWP on cooperative fish habitat monitoring efforts for Coal Creek and Cyclone Creek as noted in the DEIS.

D-7. Noxious weed mitigation is funded through all action alternatives. See Stipulation and Specifications for the Cyclone/Coal Timber Sale, Noxious Weed Management, and Herbicides on pages A-5 and A-2 for specific mitigation measures. The no action alternative and alternative F would be funded through the Flathead County Weed District and would continue to be funded after project is completed.



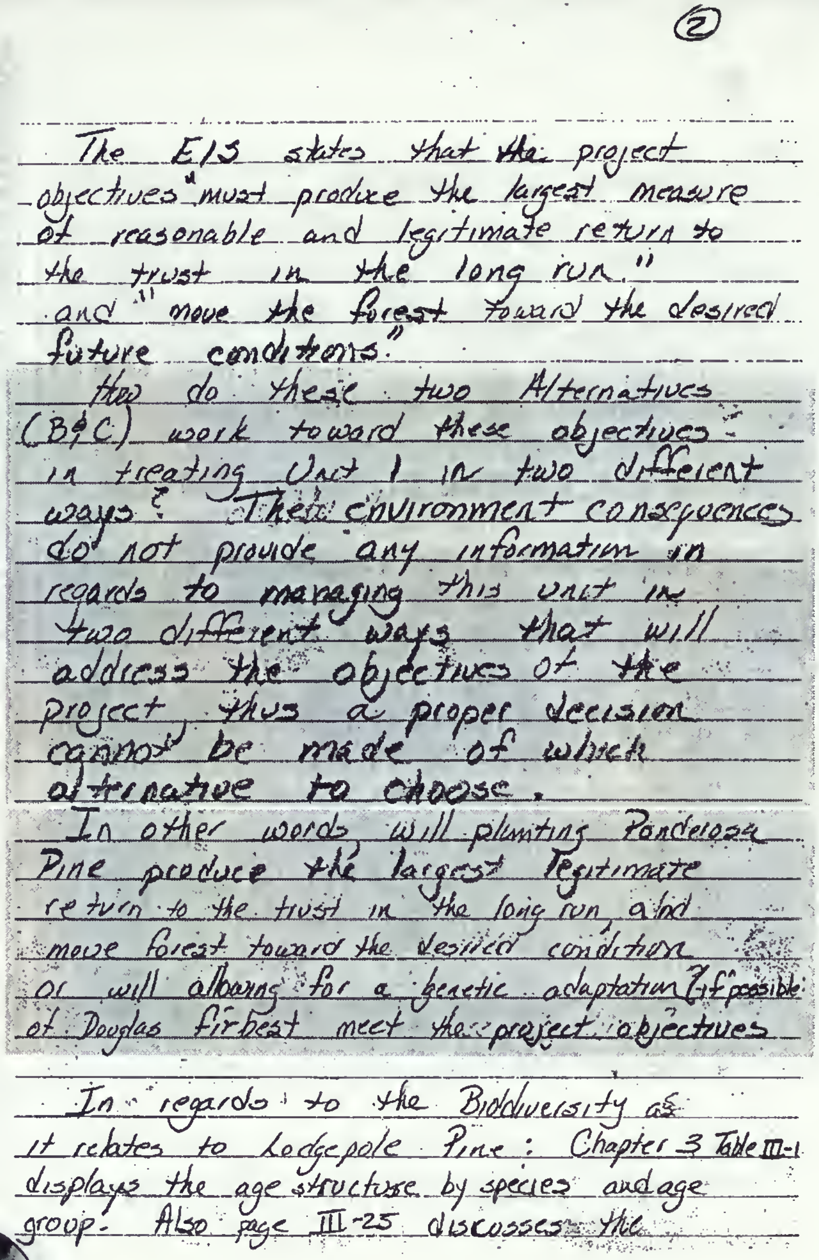
①

To Dave Parkish
Re Comments on Cyclone / Coal EIS

Dear Dave

Thank you for sending me a copy of your Coal / Cyclone EIS for comment. In reviewing the EIS I have questions and concerns involving three areas; 1) Management of root diseases 2) Management of Lodgepole stands in regard's to the SFLMP Biodiversity Standards and 3) Coal Creek Basin's Designation for a Natural Area.

It appears that the primary difference between Alternatives B and C is the the future management of Unit 1 for root diseases. Alternative B suggests planting Ponderosa Pine as a more root disease resistant tree vs. Alternative C. which suggests that Douglas fir will adapt genetically to Armillarea. This key distinction between these two alternatives suggests indirectly that root diseases are a key issue that will drive towards the decision between these two alternatives.



②

The EIS states that the project objectives "must produce the largest measure of reasonable and legitimate return to the trust in the long run." and "move the forest toward the desired future conditions."

How do these two Alternatives (B&C) work toward these objectives in treating Unit 1 in two different ways? Their environment consequences do not provide any information in regards to managing this unit in two different ways that will address the objectives of the project, thus a proper decision cannot be made of which alternative to choose. E-1

In other words will planting Ponderosa Pine produce the largest legitimate return to the trust in the long run, and move forest toward the desired condition or will allowing for a genetic adaptation ? (if possible) of Douglas fir best meet the project objectives E-2

In regards to the Biodiversity as it relates to Lodgepole Pine: Chapter 3 Table III-1 displays the age structure by species and age group. Also page III-25 discusses the

## E. Mike Justice

E-1. We acknowledge that root disease is a key issue in determining alternative treatment of the stands in question. The problem is that contrary information can be found which would support either of the Alternatives. The contrary information as conveyed in the DEIS, and as you reference, is that planting ponderosa pine will increase disease resistance of the stand, and that over time the possibility exists that Douglas-fir will genetically adapt to root disease pressures. Thus, in the belief that uncertainty can best be dealt with by development of differing approaches, we came up with the two approaches described in the EIS.

E-2. Forest Service pathologists have recently concluded that leaving pathogen resistant trees in root rot pockets may provide genetic gains in resistance for the stand. As of yet, we are uncertain as to the reliability of those studies. Due to our uncertainty of the benefits gained from allowing genetic adaptation of Douglas-fir, another alternative was developed that called for planting ponderosa pine, which has greater resistance to root rots than Douglas-fir.

③

current recruitment schedule.

Chapter IV does not display the environmental consequences of these two issues.

My question is: what age classes of lodgepole are you planning to harvest? E-3 How will this effect the your commitment to recruit old growth E-4 lodgepole in the future and how long will it take to meet your RMS in Biodiversity to attain old growth lodgepole.

This may be of particular importance since your old growth commitment on the Coal Cr. forest is 91 acres and you currently only have 76 acres in the 100-140 year age class and zero old growth.

I feel this all comes back to the project objective of "moving the forest toward the future desired conditions characterized by the proportion and distribution of forest types and structures historically present on the landscape."

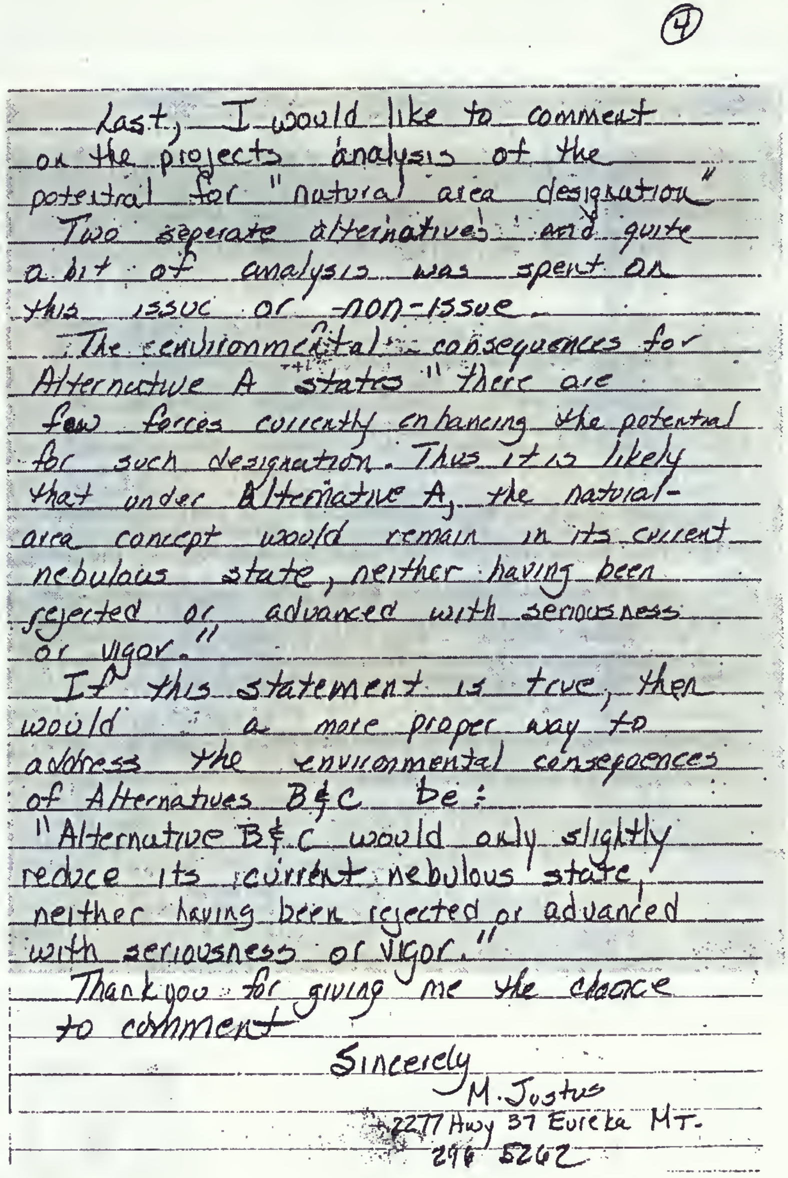
How does your harvest of lodgepole pine E-5 meet this project objective?

E-3. On page IV-1 in the DEIS, we state that under all action alternatives (B through E), 179 acres of lodgepole pine would be harvested. All 179 acres of lodgepole pine that would be harvested belong to the 40-99 age class depicted on Table III-10. Currently, there are 3,231 acres of lodgepole pine in the 40-99 age class. There are currently 76 acres of lodgepole pine in the 100-149 age class, none of which would be harvested.

E-4. Each of the action alternatives proposes to harvest only 5.5 percent (179 acres divided by 3,231 acres) of the lodgepole pine in the 40-99 age class. This will have a minimal impact on recruiting old-growth lodgepole pine in the future. Since the majority of the lodgepole pine to be recruited as old growth is currently in the 100-149 age class (76 acres), it will take approximately 50 to 60 years to meet the Biodiversity RMS of retaining half of appropriate levels of lodgepole pine that historically occurred on the Coal Creek State Forest. At least 15 acres of the 3,231 acres of lodgepole in the 40-99 age class must be recruited as old-growth lodgepole.

E-5. The harvest of lodgepole pine has a negligible impact toward meeting our objective of moving the forest toward desired future conditions. Harvesting 179 acres of lodgepole from within the 40-99 age class neither moves the forest toward or away from appropriate conditions. It does increase the acres of young stands on the Coal Creek State Forest which currently are represented in less than long term average proportions. The stand was included to meet the first project objective, which states, the project must produce the largest measure of reasonable and legitimate return to the trust in the long run. It also meets other objectives discussed in the *Purpose section*, of Newsletter Vol. I, No. 1, which states, "Adjust the lodgepole pine stands that have become uncharacteristically old or dense due to fire suppression. Reduce the risk of mountain pine beetle epidemics and uncontrollable wildland fires."

E-6. The point being expressed here is that by harvesting Unit #1 on Winnona ridge both Alternatives B and C would lesson the potential of the Cyclone Basin being classified as a future Natural Area. Due to the "nebulous state of this area of neither being rejected not advanced with seriousness and vigor" does not change this point.



④

Last, I would like to comment on the projects analysis of the potential for "natural area designation." Two seperate alternatives and quite a bit of analysis was spent on this issue or non-issue.

The environmental consequences for Alternative A states "there are few forces currently enhancing the potential for such designation. Thus it is likely that under Alternative A, the natural-area concept would remain in its current nebulous state, neither having been rejected or advanced with seriousness or vigor."

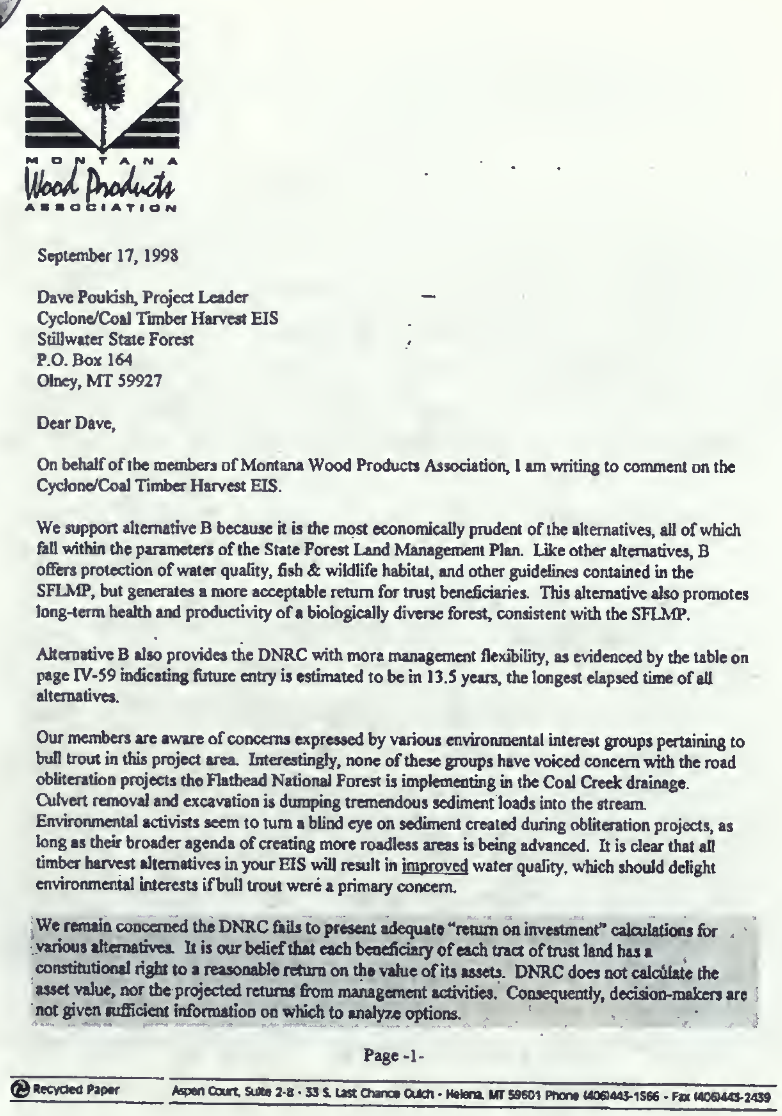
If this statement is true, then would a more proper way to address the environmental consequences of Alternatives B&C be:

"Alternative B&C would only slightly reduce its current nebulous state, neither having been rejected or advanced with seriousness or vigor."

Thank you for giving me the chance to comment

Sincerely
M. Justus
2277 Hwy 37 Eureka MT.
296 5262

E-6



MONTANA
Wood Products
ASSOCIATION

September 17, 1998

Dave Poukish, Project Leader
Cyclone/Coal Timber Harvest EIS
Stillwater State Forest
P.O. Box 164
Olney, MT 59927

Dear Dave,

On behalf of the members of Montana Wood Products Association, I am writing to comment on the Cyclone/Coal Timber Harvest EIS.

We support alternative B because it is the most economically prudent of the alternatives, all of which fall within the parameters of the State Forest Land Management Plan. Like other alternatives, B offers protection of water quality, fish & wildlife habitat, and other guidelines contained in the SFLMP, but generates a more acceptable return for trust beneficiaries. This alternative also promotes long-term health and productivity of a biologically diverse forest, consistent with the SFLMP.

Alternative B also provides the DNRC with more management flexibility, as evidenced by the table on page IV-59 indicating future entry is estimated to be in 13.5 years, the longest elapsed time of all alternatives.

Our members are aware of concerns expressed by various environmental interest groups pertaining to bull trout in this project area. Interestingly, none of these groups have voiced concern with the road obliteration projects the Flathead National Forest is implementing in the Coal Creek drainage. Culvert removal and excavation is dumping tremendous sediment loads into the stream. Environmental activists seem to turn a blind eye on sediment created during obliteration projects, as long as their broader agenda of creating more roadless areas is being advanced. It is clear that all timber harvest alternatives in your EIS will result in improved water quality, which should delight environmental interests if bull trout were a primary concern.

We remain concerned the DNRC fails to present adequate "return on investment" calculations for various alternatives. It is our belief that each beneficiary of each tract of trust land has a constitutional right to a reasonable return on the value of its assets. DNRC does not calculate the asset value, nor the projected returns from management activities. Consequently, decision-makers are not given sufficient information on which to analyze options. F-1

Recycled Paper Aspen Court, Suite 2-B · 33 S. Last Chance Gulch · Helena, MT 59601 Phone (406)443-1566 · Fax (406)443-2439

F. Montana Wood Products Association

F-1. DNRC feels that the decision-maker has enough economic information to make an informed decision.

F-2. The current Board of Land Commissioners has the legal power to delay this project for two years.

The estimated stumpage value for Alternative F, a two year deferral was based on the current Transaction Evidence (TE) equation at the time of the analysis and was adjusted based on the logging system costs. DNRC's current procedures for estimating the minimum bid for timber sales uses the current transaction evidence equation minus a roll back factor. The roll back factor reduces the estimated winning bid to reflect error in the equation and uncertainty in the market place. The estimated stumpage value for Alternative F didn't include a roll back. Thus the stumpage value is an estimate of fair market value for the stumpage value. The following are from the memo, estimating a value for delaying implementation of the Coal Creek EIS for two Years. See the project file for the memo and for all the assumptions.

Table 1. An Estimated Value/cost for a two-year Deferral for Implementing Alternatives A, B, C, D and E from the Coal Creek EIS based on Opportunity Cost

| | Estimated Stumpage $/MBF | Development Cost $/MBF | Volume MBF | Deferral Value/Cost $ |
|---|---|---|---|---|
| Alternative A | 0 | 0 | 0 | 0 |
| Alternative B | 284.92 | 62.57 | 10,865 | 222,371 |
| Alternative C | 214.02 | 72.45 | 9,383 | 144,252 |
| Alternative D | 287.59 | 67.61 | 10,055 | 207,722 |
| Alternative E | 220.87 | 77.23 | 8,803 | 139,667 |

At this point the value of the two-year Deferral was based on Alternative E. Choosing Alternative E was based on the logistic related to how DNRC plans its annual sale quantity for the three-year listing. The estimated volume for a specific project is based on the conservative low end of the estimated volume range. Thus alternative E was selected for the deferral value.

The applicant would pay us a total of $139,667 for a two-year delay in tevenue. This would result in a reduction in the NWLO annual timber volume target from 22 MMBF to 21.575 MMBF for two years. Under this option the remainder of the volume that we had scheduled to sell from the Coal Creek Timber Sale would be made up in other NWLO sales, or would have to be matched in dollars for the amount of reduction in harvest.

F-3. DNRC has not received any interest in funding Alternative F and is dropping this alternative from consideration. While the options listed above are reasonable methods for determining whether to select Alternative F versus another alternative, DNRC reserves the right to estimate the fair market value based on reasonable and legitimate methodologies. These methods could be discounted cash flow or an analysis of comparable sales.

Alternative F is unacceptable because it is an abdication of responsibility. A two-year deferral is an unnecessary delay that pushes the burden of decision-making onto a new Administration, and a new Board of Land Commissioners. Further, the value calculated for the "deferral" is based on an arbitrary appraisal of timber. It is not "fair market value." During FY 97, the average winning bid for a DNRC timber sale was 37 percent higher than the appraisal. Consequently, any conservation license or non-management fee negotiated using the appraisal estimates could be substantially below fair market value, and consequently illegal. F-2

While an obligation may exist to analyze all legitimate options, we request that DNRC revise alternative F to reflect "full, fair market value." One option is to accept bids on alternative B, with a contract provision that alternative F may be selected if an interested party is willing to purchase a two-year deferral calculated using the highest timber bid. Another option is to issue "request for proposals," and compare timber sale options with other legitimate revenue-producing ideas. Maybe critics of timber management would look more favorable on a new ski resort in this area. F-3

The U.S. Congress has already created huge "natural areas" in this vicinity. Glacier National Park, National Forest wilderness areas, and vast areas of national forest that are off-limits to logging generally characterize this area. Conversely, Congress granted land to the State of Montana to manage in support of public institutions. With Montanans ranking near the bottom in terms of per capita income, it is amazing so much effort is expended toward proposals which further erode our scarce resource base. Economic opportunity is lost every time an acre of land is removed from productive management. Rural communities cannot thrive when surrounded by millions of acres of "natural areas" that require few tangible economic inputs.

At a time when the Montana Department of Commerce is launching major efforts to jump start economic development focused on creating "more better paying jobs," DNRC is offering alternatives for trust land management which do exactly the opposite. "Adding value" to our natural resources is currently a predominant theme for state government. Creating yet another natural area to constraio timber harvest actually subtracts value for local businesses that sell fuel, lubricants, parts, machinery, or offer services such as welding, tire repair etc.

From the standpoint of protecting landscapes, society is chasing its tail trying to "buffer the buffers." Some our land must be used to sustain communities and residents.

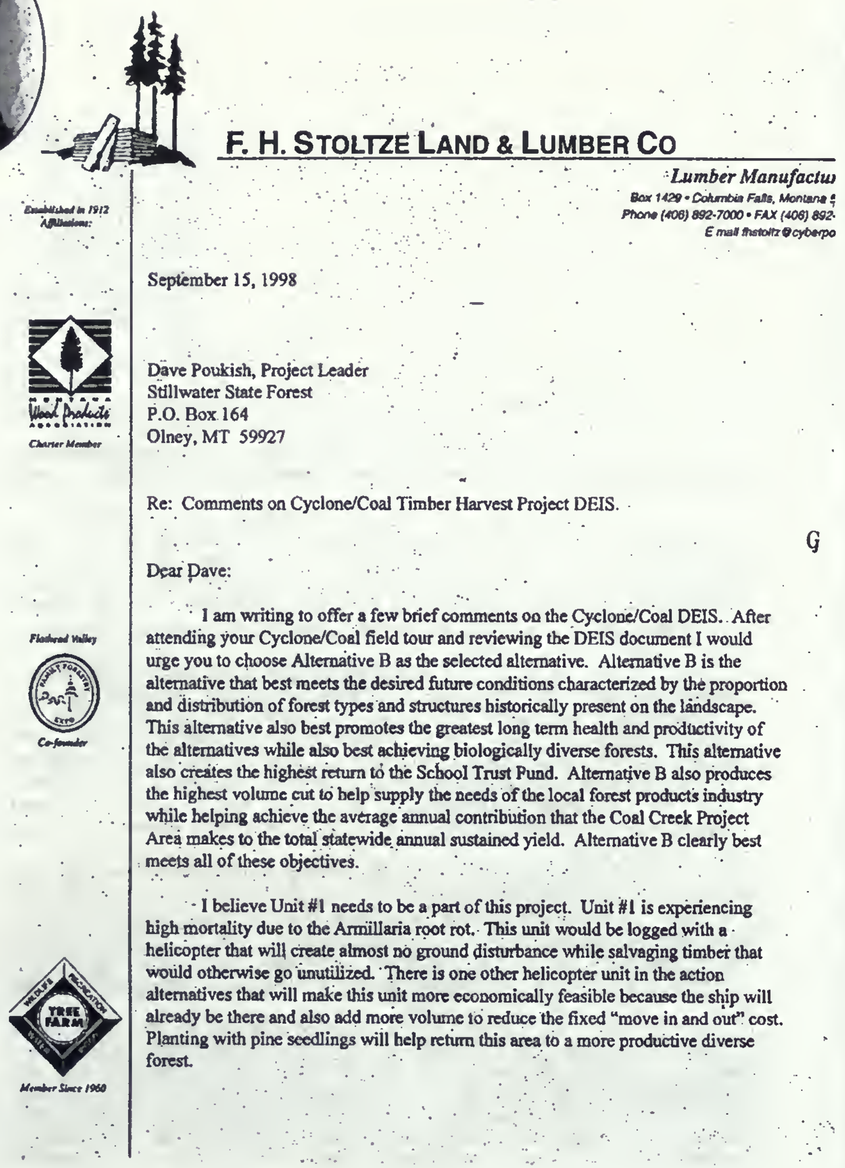
Thank you for the opportunity to comment. We look forward to further discussions.
Sincerely,

Cary Hegreberg
Executive Vice President

c: MonTrust
Bud Clinch

Specific concerns related to the first option are two. First it requires DNRC to incur all the costs to complete the field work, contract development and advertising related to the sale before rejecting Alternative F. If Alternative F is selected much of the field work that was completed may be wasted due to a new alternative being selected based on a larger landscape view. The second concern is that the risks are not the same between a timber sale and a two-year deferral or a conservation license. The risks are higher in some areas of the state versus others. The risks of lawsuits and lower actual returns (winning bid times sale volume) from a timber sale in the Swan are high. Thus Board of Land Commissioners could use this information in setting and excepting a value for a combined timber harvesting and conservation license that is lower in value than an alternative that is strictly timber harvesting.

The other option, issue "request for proposals" is a reasonable process given the changing land values and increasing controversial nature of timber sales in Montana. Using this process to broad range of alternatives would be evaluated in DNRC MEPA documents. Thus giving the DNRC decision-maker and Board of Land Commissioners a greater range of alternative to select from. In a places like Coal Creek State Forest having an alternative developed by the Timber Industry would help frame future management direction.



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Established in 1912
Affiliations:
Montana Wood Products Association
Charter Member
Flathead Valley
Co-founder
Tree Farm
Member Since 1960

September 15, 1998

Dave Poukish, Project Leader
Stillwater State Forest
P.O. Box 164
Olney, MT 59927

Re: Comments on Cyclone/Coal Timber Harvest Project DEIS.

G

Dear Dave:

I am writing to offer a few brief comments on the Cyclone/Coal DEIS. After attending your Cyclone/Coal field tour and reviewing the DEIS document I would urge you to choose Alternative B as the selected alternative. Alternative B is the alternative that best meets the desired future conditions characterized by the proportion and distribution of forest types and structures historically present on the landscape. This alternative also best promotes the greatest long term health and productivity of the alternatives while also best achieving biologically diverse forests. This alternative also creates the highest return to the School Trust Fund. Alternative B also produces the highest volume cut to help supply the needs of the local forest products industry while helping achieve the average annual contribution that the Coal Creek Project Area makes to the total statewide annual sustained yield. Alternative B clearly best meets all of these objectives.

I believe Unit #1 needs to be a part of this project. Unit #1 is experiencing high mortality due to the Armillaria root rot. This unit would be logged with a helicopter that will create almost no ground disturbance while salvaging timber that would otherwise go unutilized. There is one other helicopter unit in the action alternatives that will make this unit more economically feasible because the ship will already be there and also add more volume to reduce the fixed "move in and out" cost. Planting with pine seedlings will help return this area to a more productive diverse forest.

Old-growth is an issue that is discussed throughout the DEIS. Currently the Coal Creek Forest contains 5,306 acres of old-growth stands which is 35% of the total forested acres. This old-growth is far above SFLMP minimum old-growth acres in all cover types with only the Western Larch/Douglas-fir cover type less than what is considered appropriate. Alternative B will focus on converting stands of mixed conifer into Western Larch/Douglas-fir cover type that will eventually create more old-growth in the Western Larch/Douglas-fir cover type. Old-growth should not be an issue in the Coal Creek Forest.

Stoltze would hope to see this project move forward and implemented. This area is tremendously productive and needs to be managed to insure this forest remains healthy and productive. Thank you for the opportunity to comment on this project.

Sincerely,

Tom Tintinger

Tom Tintinger
Forester

TT/tc

G. Stoltze Land & Lumber Co.

No response.

United States Department of the Interior

NATIONAL PARK SERVICE
Glacier National Park
West Glacier, Montana 59936

IN REPLY REFER TO:

L7019
SEP 22 1998

Mr. Robert L. Sandman,
Unit Manager
Stillwater State Forest
Post Office Box 164
Olney, MT 59927

H

Dear Mr. Sandman:

The following are Glacier National Park's comments on the Cyclone/Coal Timber Harvest Project Draft Environmental Impact Statement:

Glacier National Park reiterates its support for managing the Cyclone Lake drainage basin as a natural area, in accordance with the Montana Natural Areas Act. We concur that this area represents important nesting habitat for bald eagles and loons and is also an important core habitat for grizzly bear. We urge the Montana Department of Natural Resources and Conservation (DNRC) to protect the resources of this basin from timber harvest regardless of the alternative chosen. The McFadzen report indicates that eagles nesting at Cyclone Lake feed in the North Fork of the Flathead River and thus at times within Glacier National Park

Glacier also supports the seasonal closure (included in all of the alternatives) of the road leading into Cyclone Lake, so as to protect the early portion of the eagle nesting season. For similar reasons, we support the proposed timing restrictions for helicopter flights over Cyclone Lake that would be included in any timber sale contract.

Glacier is supportive of the interagency planning analysis provided for in Alternative F and will assist the DNRC and other agencies in cooperatively developing this management philosophy, should the opportunity arise in the future.

Glacier notes that some cutting units in Alternatives B, C, D and E would be visible from park roads, as well as the county road on the west side of the North Fork of the Flathead River. We support silvcultural harvest methods that feather the edges of these cutting units and leave patches of lightly or unharvested timber, so as to mimic the effects of natural fire.

Your agency deserves praise for preparing a thorough, yet concise document.

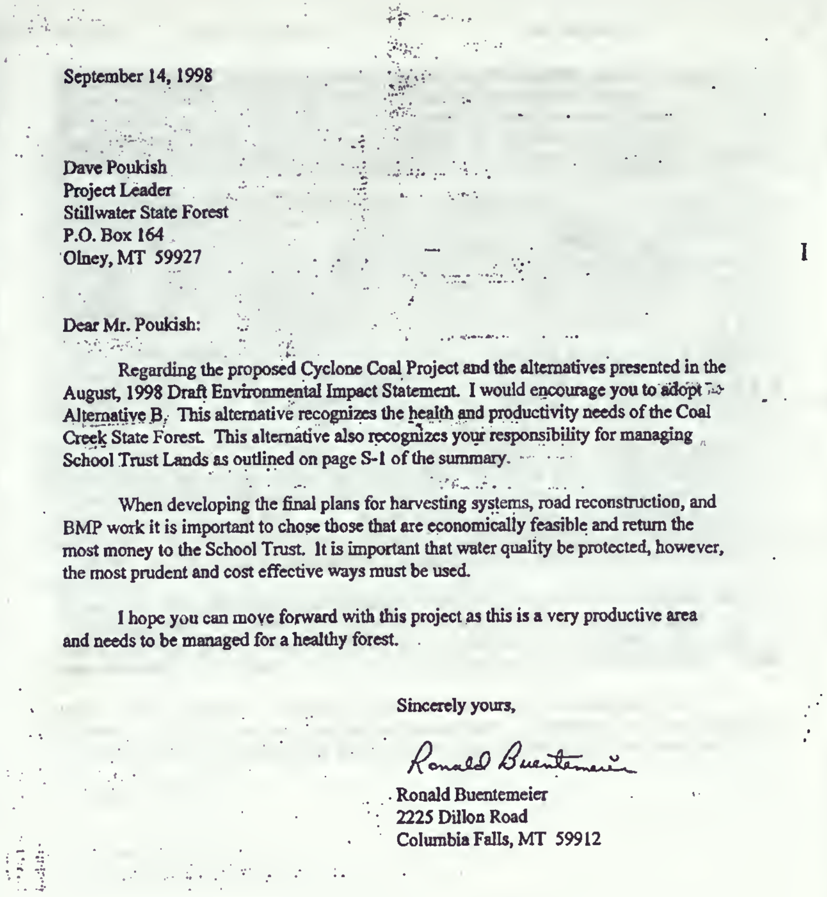
Thank you for the opportunity to comment.

Sincerely,

David A. Mihalic
Superintendent

## H. United States Department of the Interior, NPS, Glacier Nat'l Park

No response.



September 14, 1998

Dave Poukish
Project Leader
Stillwater State Forest
P.O. Box 164
Olney, MT 59927

Dear Mr. Poukish:

Regarding the proposed Cyclone Coal Project and the alternatives presented in the August, 1998 Draft Environmental Impact Statement. I would encourage you to adopt Alternative B. This alternative recognizes the health and productivity needs of the Coal Creek State Forest. This alternative also recognizes your responsibility for managing School Trust Lands as outlined on page S-1 of the summary. I

When developing the final plans for harvesting systems, road reconstruction, and BMP work it is important to chose those that are economically feasible and return the most money to the School Trust. It is important that water quality be protected, however, the most prudent and cost effective ways must be used.

I hope you can move forward with this project as this is a very productive area and needs to be managed for a healthy forest.

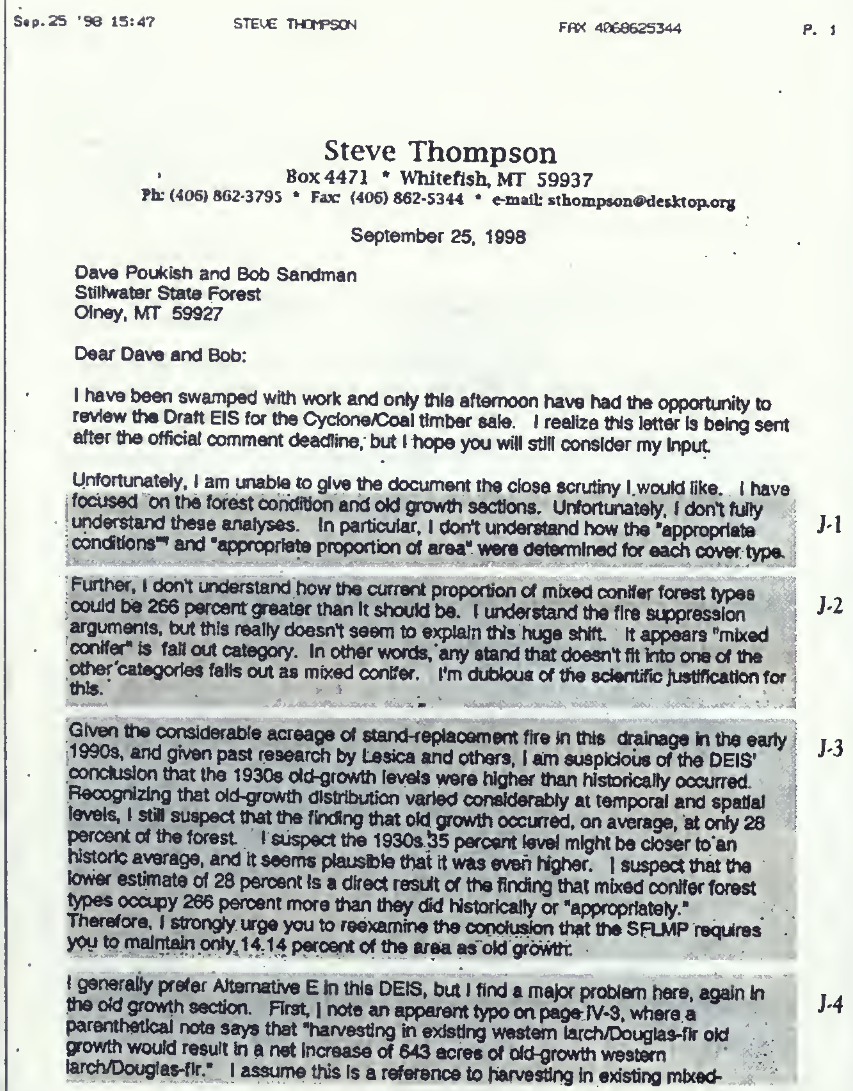
Sincerely yours,

Ronald Buentemeier

Ronald Buentemeier
2225 Dillon Road
Columbia Falls, MT 59912

## I. Ronald Buentemeier

No response.



Sep.25 '98 15:47 STEVE THOMPSON FAX 4068625344 P. 1

Steve Thompson
Box 4471 • Whitefish, MT 59937
Ph: (406) 862-3795 • Fax: (406) 862-5344 • e-mail: sthompson@desktop.org

September 25, 1998

Dave Poukish and Bob Sandman
Stillwater State Forest
Olney, MT 59927

Dear Dave and Bob:

I have been swamped with work and only this afternoon have had the opportunity to review the Draft EIS for the Cyclone/Coal timber sale. I realize this letter is being sent after the official comment deadline, but I hope you will still consider my input.

Unfortunately, I am unable to give the document the close scrutiny I would like. I have focused on the forest condition and old growth sections. Unfortunately, I don't fully understand these analyses. In particular, I don't understand how the "appropriate conditions"" and "appropriate proportion of area" were determined for each cover type. J-1

Further, I don't understand how the current proportion of mixed conifer forest types could be 266 percent greater than it should be. I understand the fire suppression arguments, but this really doesn't seem to explain this huge shift. It appears "mixed conifer" is fall out category. In other words, any stand that doesn't fit into one of the other categories falls out as mixed conifer. I'm dubious of the scientific justification for this. J-2

Given the considerable acreage of stand-replacement fire in this drainage in the early 1990s, and given past research by Lesica and others, I am suspicious of the DEIS' conclusion that the 1930s old-growth levels were higher than historically occurred. Recognizing that old-growth distribution varied considerably at temporal and spatial levels, I still suspect that the finding that old growth occurred, on average, at only 28 percent of the forest. I suspect the 1930s 35 percent level might be closer to an historic average, and it seems plausible that it was even higher. I suspect that the lower estimate of 28 percent is a direct result of the finding that mixed conifer forest types occupy 266 percent more than they did historically or "appropriately." Therefore, I strongly urge you to reexamine the conclusion that the SFLMP requires you to maintain only 14.14 percent of the area as old growth. J-3

I generally prefer Alternative E in this DEIS, but I find a major problem here, again in the old growth section. First, I note an apparent typo on page IV-3, where a parenthetical note says that "harvesting in existing western larch/Douglas-fir old growth would result in a net increase of 643 acres of old-growth western larch/Douglas-fir." I assume this is a reference to harvesting in existing mixed- J-4

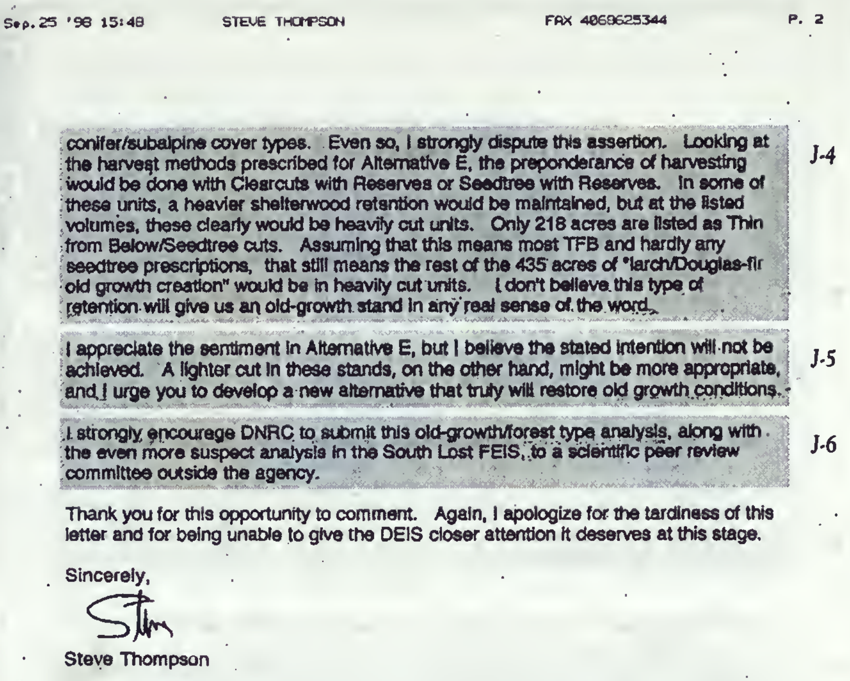
## J. Steve Thompson (9/25/98)

J-1. *Appropriate Conditions:* Please refer to pages III-2 through III-3, and III-23 through III-24 in the DEIS. Table III-14 describes the protocol for assigning appropriate conditions by cover type from our current stand level inventory (SLI). Stands are evaluated against the criteria in the table beginning with white pine and proceeding down the Cover Type column. Once assigned, a stand is not evaluated against other cover-type criteria. This procedure is referred to as the Appropriate Conditions Filter. For example, if our SLI shows that a stand is currently composed of ≥ 10 percent of white pine, then the stand is categorized as an appropriate white pine stand. A subsequent stand may have < 10 percent white pine and ≥ 20 percent of ponderosa pine in its current composition. This stand would be categorized as an appropriate ponderosa pine stand. This procedure (Appropriate conditions filter) is applied to all stands on the Coal Creek State Forest in accordance with Table III-14, until all stands have been categorized into their appropriate conditions. Remember, a stand can only be assigned to one appropriate cover type condition. There is no supposition that this filter is the end-all, be-all indicator of appropriate conditions. Rather it represents a methodology, founded in succession theory, that we use for a first approximation of appropriate cover type representation. Additionally, local knowledge of particular stands by unit foresters can be used to adjust the Appropriate conditions filter suggestions to define a future condition more suited to a particular landscape.

*Appropriate Proportion Area:* In Table III-15, the second column lists the Appropriate Proportion of the Area. This is merely the proportion of appropriate acres of each cover type (based on the aforementioned procedure, that is, the appropriate conditions filter) for the entire Coal Creek State Forest (CCSF). See Figure III-4 (p. III-3) for appropriate acres by cover type for the CCSF. For example, Figure III-4 shows that DNRC has determined 6,335 acres of the western larch/ Douglas-fir cover type to be the appropriate number of acres for that cover type using (Appropriate Conditions Filter. Table III-15 on page III-24 shows that the Appropriate Proportion of Area (CCSF) for western larch/Douglas-fir is 42 percent, which is 6,335 acres of western larch/Douglas-fir divided by the total forested acres on the CCSF (15,094 acres).

J-2. According to Figure III-4, the number of appropriate acres of mixed conifer cover type equal 1,393 acres. In Table III-10, we show that currently there are 3,671 acres of the mixed conifer cover type. This is an increase in the mixed conifer cover type by approximately 266 percent as you state. Our mixed conifer cover type category is a collection of all remaining stands that were not previously assigned to another appropriate cover type class. The mixed conifer type is labeled as spruce-fir form the historic data. We are calling it mixed conifer because the description from Losensky (1997) indicates it is the best fit. Some overlap between the subalpine type undoubtedly occurred in the 1930s inventory as this type encompassed both low elevation mixed conifer stands and high spruce-fir basins. We believe the label 'mixed conifer' is the most accurate possible for the class.

J-3. DNRC has chosen to use the *climatic section proportion of old stands*, by cover type, from the 1930s' inventory (Losensky 1997), as its numeric criterion for assessing compliance with our commitment to retaining a minimum of 50 percent of old-growth amounts that would be expected to occur with natural processes on similar sites. We feel that this procedure (using the climatic section average, coupled with cover types), more accurately accounts for naturally occurring amounts of old growth than using the CCSF proportion of old stands from the 1930s inventory.



Sep.25 '98 15:48 STEVE THOMPSON FAX 4068625344 P. 2

conifer/subalpine cover types. Even so, I strongly dispute this assertion. Looking at the harvest methods prescribed for Alternative E, the preponderance of harvesting would be done with Clearcuts with Reserves or Seedtree with Reserves. In some of these units, a heavier shelterwood retention would be maintained, but at the listed volumes, these clearly would be heavily cut units. Only 218 acres are listed as Thin from Below/Seedtree cuts. Assuming that this means most TFB and hardly any seedtree prescriptions, that still means the rest of the 435 acres of "larch/Douglas-fir old growth creation" would be in heavily cut units. I don't believe this type of retention will give us an old-growth stand in any real sense of the word. J-4

I appreciate the sentiment in Alternative E, but I believe the stated intention will not be achieved. A lighter cut in these stands, on the other hand, might be more appropriate, and I urge you to develop a new alternative that truly will restore old growth conditions. J-5

I strongly encourage DNRC to submit this old-growth/forest type analysis, along with the even more suspect analysis in the South Lost FEIS, to a scientific peer review committee outside the agency. J-6

Thank you for this opportunity to comment. Again, I apologize for the tardiness of this letter and for being unable to give the DEIS closer attention it deserves at this stage.

Sincerely,

Stm

Steve Thompson

Table III-4 shows that approximately 29 percent of the Climatic Section (Upper Flathead Valley) 333C was comprised of old stands in the 1930s, and Table III-5 shows that approximately 32 percent of the CCSF in the 1930s was comprised of old stands. We have chosen to use the climatic section average from the Upper Flathead Valley, instead of the CCSF, as the unit of analysis for old growth proportions by cover type, because we have concerns about using data from small scale assessments made at one point in time as you alluded to in your comments. For instance, if we used only the CCSF as the analysis area, and in 1930 a fire went through the CCSF and burned up the entire forest, then historically (based on 1930s inventory) there could have been zero acres of old stands. By using the climatic section average, we feel that we can substitute space for time to account for random disturbances that historically affected the CCSF, and thus more accurately reflect a long-term sustainable condition.

We assume you are referring to the larger North Fork of the Flathead with your 1990s fire statement. Our analysis focused on the Coal Creek State Forest which did not experience the fires referred to.

Your conclusion that the over representation of the mixed conifer type results in the lower estimates for appropriate old growth amounts is incorrect. The western larch / Douglas-fir type is the type most under represented and it has a higher proportion of old growth than does the mixed conifer. Thus, increasing mixed conifer acres at the expense of western larch / Douglas-fir would actually decrease our old growth requirements.

J-4. Your first assertion that there is an apparent typo on page IV-3 is correct. The statement should read, "(harvesting in existing mixed conifer old growth would result in a net increase of 643 acres of old-growth western larch/Douglas-fir, and will be amended as such in the FEIS.) You state that only 218 acres are listed as Thin from Below/Seedtree cuts. The information that you are citing from Table II-2 is incorrect. Unit 5 (495 acres) incorrectly shows that a CCR/SH treatment would be used. Please refer to Figure II-3 and you will see that unit 5 is utilizing a Thinning from Below/Seedtree cut, just as is being used in unit 2 (218 acres). Table II-2 will be corrected in the FEIS to show that unit 5 would utilize a Thinning from Below/Seedtree with reserves (TFB/STR) cut.

J-5. Alternative E was designed to increase the proportions of the western larch/Douglas-fir and western white pine cover types by removing encroaching mid-level and understory mixed conifer trees in stands currently classified as mixed conifer or subalpine fir. This approach would enter old-growth stands, but retain large old trees, large snags, and concentrations of down woody material. Multiple canopy layers and associated old-growth attributes would redevelop as shade-tolerant species regenerate into the future. Connectivity between old-growth stands would be maintained by retaining these old-growth characteristics in the stands. Additionally, Alternative E does not propose to harvest in unit 1, thus retaining the potential for that area to be designated a Natural Area in the future. We feel that this alternative meets the objectives of the proposed action, is consistent with the management philosophy of the SFLMP, and addresses the issues and concerns of the interested public. We see no need to develop another alternative at this time.

J-6. The procedures followed in the Cyclone/Coal DEIS are those laid in the DNRC's adopted Biodiversity Implementation Guidelines. The South Lost FEIS is being amended in a supplement that will follow the same procedures. The Biodiversity Guidelines (procedures for old-growth/forest type analysis) were developed over a two-year period and were submitted to various forest scientists for peer review. They were sent to two forestry professors (Forest Ecology and Silviculture) at the University of Montana, one retired Ecosystem Management Scientist from the Intermountain Station, one member of the Forest Service, and one timber industry professional. Their comments were incorporated into the final version of the Guidelines.

Steve Thompson
Box 4471 * Whitefish, MT 59937
Ph: (406) 862-3795 * Fax: (406) 862-5344 * e-mail: sthompson@desktop.org

October 13, 1998

Bob Sandman, Unit Manager
Stillwater State Forest
P.O. Box 164
Olney, MT 59927

Dear Bob:

Thank you for holding the field trip to the Cyclone/Coal Timber Sale area. Based upon my observations, I'd like to provide the following suggestions:

1) I was disappointed with your indication that comments generated during the field trip would not be used to modify the FEIS or affect the decision. This is alarming given the magnitude of the project. The time line you described does not appear to allow for adequate consideration of public comment. Nor does it allow for a peer review of the DEIS' controversial and confusing old-growth analysis, a suggestion I made in my earlier letter. K-1

2) The old-growth analysis and proposed logging are problematic for the following reasons:

a) This forest is in a particularly wet and cool environment, which is reflected by the frequency of spruce-fir mixed conifer forest types on the cool and moist sites. The 1930s data found mixed conifers occupied 16 percent of the forest and now mixed conifers occupy 24 percent of the Coal Creek Forest. Yet the "appropriate" percentage of mixed conifer identified in Table III-15 is listed at 9 percent, and this finding fuels the assertion on P. III-22 that old shade-tolerant cover types are grossly overrepresented, 266 percent overrepresented in the mixed conifer class. These assertions of "appropriate" cover type simply are not explained or justified adequately in the DEIS, and it doesn't seem to match the actual on-ground conditions. The Coal State Forest is mostly a wet and cool forest type. K-2

b) I question the assertion that old-growth acreage has increased form 32 percent to 35 percent since the 1930s. Much or most of the logging in the state forest since the 1930s, including the spruce logging of the 1950s, was in old-growth stands of beautiful spruce. If there was an "unnatural" increase of old-growth acreage, despite all of this past logging, it might have been in subalpine areas where old-growth subalpine fir is defined more by age than by function. But the treatments don't appear to target these "unnatural" stands, if that's what they are. Instead, the logging targets the lower-elevation, irreplaceable old-growth such as in unit 2, which is K-3

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K. Steve Thompson (10/13/98)

K-1. DNRC intends to incorporate new and different comments that were generated during the field trip into its decision-making process. We are sorry for any miscommunication that may have led you to believe otherwise. We were trying to emphasize that the purpose of the tour was not to extend the comment period.

Regarding the time line for public involvement, we must point out that the initial field tour to the project area was held on October 6, 1997, over one year ago. Additionally, we have published four newsletters, which have kept the public informed throughout the development of this project. We feel that the time line described has allowed for adequate consideration of public comment. Refer to page 1-2 in the DEIS, where we discuss public scoping.

Regarding your third comment, please refer to response J-6.

K-2. Regarding your comment about "appropriate" cover types, please refer to response J-1. Regarding your statement that the Coal Creek State Forest is mostly a wet and cool forest type, please refer to pages III-1 and III-11 in the DEIS. The Coal Creek State Forest is a cool, generally moist forest, as indicated by the dominance of cool habitat types. Approximately 60 percent of the forest is cool and moist, while approximately 22 percent is cool and moderately dry. Only about 7 percent of the forest is wet.

K-3. Approximately 66.6% of the total treated area in the Coal Ck State Forest occurred in old growth stands. In other words, about 1/3 of the treatments we applied in the Coal Ck occurred in non-old growth stands. Approximately 20% of the old growth stands that occurred since the turn of the century in the Coal Ck forest have been treated. About 65% of the treatments that occurred in old growth stands were even aged treatments (clear cut, seed tree or group selection). The remaining 35% were salvage or individual/select tree treatments.

Through succession and fire suppression, the Coal Creek State Forest is losing representation of shade intolerant tree species (e.g., western larch). DNRC believes that without sound management of state forests, shade tolerant tree species will continue to encroach and that natural forest conditions will cease to exist without our intervention. Through disturbance, we must create conditions that will perpetuate cover types and structural attributes that we desire to see in the future. We feel that we have targeted stands in this project to move us toward a more appropriate condition on the Coal Creek State Forest.

K-4. Please refer to response J-3.

K-5. Please refer to response B-5. Unit 2 is a subalpine fir stand, not a Douglas-fir stand; the colors will be more legible in the new old-growth map.

K-6. Please refer to response B-7.

K-7. Please refer to response L-1 and L-2.

undeniably a natural old-growth stand on this wet north-facing slope.

c) The DEIS assertion that even the 1930s level of old-growth was above the "natural conditions," is highly suspect and unsupported by the analysis. The large fire that ran through the forest just a couple decades earlier probably reduced old-growth percentages prior to the 1930s inventory. The 28 percent figure appears based on abstract numerical games rather than a specific forest-wide assessment, such as could have been provided by fire historian Steve Barrett. K-4

d) Unit 2 is identified in the old-growth map (Figure III-18) as a Douglas fir cover type (unless the red means HW cover type, which I assume means "hardwood" and would not be applicable.) Yet Table IV-2 shows no reduction in old-growth Douglas fir acreage. This typifies the confusing presentation of data and analysis for old-growth, and it strongly suggests that this analysis should be presented more clearly to the public before the massive and experimental logging proposed for units 2 and 5. K-5

e) The loggers who attended the field trip raised serious concerns about the intensity and scale of some of the proposed logging, especially in units 2 and 5. They spoke of the likelihood of major blowdown on this wet site and the unique character of the stand. All three have worked in these north-facing stands in Coal Creek, but their concerns don't appear to have been heeded. K-6

f) The State Forest Plan provides for a monitoring and adaptive management approach that would appear to encourage a more limited and experimental approach to units 2 and 5. (See page 1011 and 16-17 of the state forest plan record of decision.) Rather than trying to treat the entire stand through the dubiously-named "Thinning from Below" treatment, try this prescription on a much smaller scale and then evaluate and adapt. (14,000 board feet per acre in unit 2 under Alt. C does not indicate thinning from below.) Given the past logging in these areas, the scale and intensity of the various treatments in units 2 and 5 would preclude the opportunity to learn and adapt. That's because the entire slopes would be treated all at once. K-7

g) The idea that logging of units 2 and 5 under Alt. C and E would create an additional 643 acres of larch-fir old growth is asserted but unsupported in the DEIS. This is a novel approach that certainly should be reviewed by an outside peer-review panel and then tested on a much more modest scale. K-8

I would suggest a much more modest scale of logging in units 2 and 5, accompanied by an ongoing salvage program such as currently being done by RBM Lumber. Try the prescription in Alt. C, but reduce the acreage considerably. The state's major problems dealing with its old-growth analysis in Lost South and now in this DEIS should demand a more cautious and humble approach.

3) As detailed above, all the proposed alternatives for units 2 and 5 fail to take a cautious, adaptive management approach. This is especially unfortunate given the extremely poor market conditions facing the wood products industry. Why sell into a K-9

K-8. We stand by our old growth and vegetation analysis in the DEIS. Regarding your request for a peer-review panel, please refer to response J-6.

K-9. Please refer to responses B-22.

K-10. Please refer to response L-3.

K-9 weak market, which is likely to attract low bids? Tom Tittinger from Stoltze answered this question by saying the timber mills need a regular supply. However, the trust mandate is to maximize revenue rather than to provide a regular supply of timber to mills. Ironically, Tom mentioned that Stoltze would be unlikely to bid successfully on the sale given cash flow problems. In all likelihood, you'll only have a couple low bids on these large units. That doesn't mean it won't be highly profitable for successful bidder, which will be rewarded by the lack of competitors, but it won't be that great for the trust fund. If the driver here is HB 201, this raises the very real question of whether HB 201 is consistent with the trust mandate for state lands. I heard Pat Flowers say he doesn't think the state is capable of responding to changing market conditions (although private industry doesn't seem to have this problem), but I believe its ridiculous to sell into such a weak market with such a large-scale and experimental project.

K-10 RBM's Malcolm Thompson's suggestion to concentrate management of the unit 5 area in an ongoing salvage program makes a lot of sense economically, as well. For that salvage sale, there were six or so bidders, and the state was amazed at the generosity of RBM's high bid. Reasons for the high bid include 1) more competition and 2) it is being processed for a more specialized lumber market that is relatively immune to the fluctuations of commodity markets.

It appears that DNRC's rush to get out this sale, in conjunction with HB 201, violates the state land trust mandate to maximize revenue to the trust fund.

I urge you to slow down here and get it right. Prepare an understandable and improved old-growth analysis and make it available for public comment (since the comment period on the DEIS was rather meaningless given that the old-growth analysis doesn't make sense). Submit the old-growth analysis and proposed actions for outside peer review. Then proceed much more cautiously than outlined in all of the alternatives, which don't adequately cover the reasonable range of possible activities.

Sincerely,

Steve Thompson

cc: Pat Flowers
State Land Board

## L. Comments from Field Tour not previously submitted to DNRC (10/6/98)

**1. A comment was made that the thinning from below treatments would not emulate a mixed severity fire.**

A. Mixed severity fires by definition result in mortality of 15 to 85% of the trees within the burned area. These fires burn through an area with mixed results, as the name implies, flaring up occasionally and killing more trees, while in other areas burning through with little or no mortality. Some places, when looking at the small scale, would appear to be non-lethal underburns, while others would appear to be stand replacement fires. Depending on the overall mortality level the stand replacement appearance, the non-lethal appearance or neither could dominate the overall look of the burn area post-fire. At 85% mortality the area would look similar to a seed tree with reserves. At 15% mortality the area would look similar to a selection harvest. The definition is obviously quite broad.

The trees most susceptible to succumb to fire are those with thin bark, in dense clumps, or with branches extending to near ground level. The characteristics mentioned are often associated with shade tolerant trees growing under an over story of shade intolerant trees. Our treatments are focused on the shade tolerant mid and under story trees likely to die in a mixed severity fire. We would remove approximately 50% of the volume in one unit and about 25% in another. Both removals fall well within the range defined for mixed severity fires with the 25% removal representing a light touch.

Mixed severity fires result in a stands made up of a mosaic of patches post-fire. Our treatments are designed to do the same leaving patches relatively untouched while harvesting more heavily in other areas. The treatment was designed by members of the ID team with our wildlife biologist playing a key role throughout.

**2. The comment was made regarding the South Coal area that it seems obvious that the slope was in a stand replacement regime. Given a stand replacement regime how can we say our thinning from below treatment would emulate a natural process.**

A. In general we agree with the comment that the slope probably is more likely to burn in a stand replacement event than under other scenarios. However, we also recognize that any site can burn in fires that could be labeled as any one of the major regimes. For example, simply because the most recent disturbance on an area appears to be a stand replacement event does not mean that mixed severity or non-lethal fires do not occasionally, or even frequently burn there. Work being conducted at the Fire Sciences Lab in Missoula focuses on estimating the probability of the various classifications of fire occurring on a particular site. In virtually every circumstance the possibility exists for any kind of fire to occur, depending on weather, stand conditions, topography, etc. This probability matrix concept is preferable to fire history studies that sample with limited reliability beyond the last stand replacement event, and may miss many or even most of the less lethal events.

The inclusion of a mixed severity emulation treatment on South Coal allows the decision maker to weigh other concerns and objectives with the knowledge that the planned treatment still emulates a likely occurring natural disturbance event.

We do not accept the notion that fires of varying severity cannot occur on any particular site. We do, however, believe that some fires are more likely than others on particular sites, and that some regimes are more interchangeable than others. For example, we would be unlikely to suggest a non-lethal underburn be used as a substitute for a stand replacement fire. However, we believe a treatment designed to emulate a mixed severity fire can be appropriately applied to an area that last burned in a stand replacement event.

**3. The comment was made that we would be better off simply salvaging the forest and removing only the dead, down and dying. A similar comment echoed that sentiment suggesting more frequent less intensive treatments would be more preferred.**

A. The salvage suggestion is clearly contrary to the spirit and letter of the SFLMP. For one reason we would be removing the characteristics (i.e., down woody material, snags, structure, etc.) that make old growth forests functionally different than other younger forests. For another, we know of no natural process this approach would be emulating.

Regarding the more frequent, less-intensive approach our analyses support the fact that the planned treatments represent, in fact, a very light series of treatments. The CCSF currently has over twice the minimum commitment to old growth retention made in the SFLMP. The analysis also shows that the age class most under represented on the CCSF is the 0 to 39 year class, currently at 11% versus a 1930s representation of 39%. Further, as stated above, certain disturbance events are more interchangeable than others. For example, we feel comfortable suggesting the lighter touch of a mixed severity event in lieu of a stand replacement event, while acknowledging the stand replacement event has an equal likelihood of occurring. We do not believe that a frequent entry, even lighter touch than our thinning from below, represents an acceptable substitute for a stand replacement event.

An important point often overlooked is that we are managing for a long-term sustainable condition, not maintenance of the status quo, nor replication of some historical snapshot in time. Previous and on-going fire suppression activities, introduced diseases, and forest succession have resulted in a forest more prone to catastrophic fire than would be desirable for long term sustainability. For the stands in question, a series of lighter treatments would not be representative of natural disturbance processes, and would do little, if anything, to promote long term sustainability.

The SFLMP, unanimously signed off on by the State Land Board, clearly states that we would use timber harvesting to promote our biodiversity goals. Those goals would be achieved through implementation of a coarse filter approach favoring a diversity of stand structures and compositions. This diversity would help reduce catastrophic wildfire and insect and disease attacks. A significantly lighter touch would ignore our coarse filter commitments and do nothing toward meeting our SFLMP commitments of promoting diversity while reducing the likelihood of catastrophic events.

From a wildlife perspective, human disturbance and roads negatively affect wildlife species. The presence of humans and/or use of roads limit the amount of habitat available to wildlife species. Typically, animals avoid habitats adjacent to human activities. Human disturbance usually results in increased stress, energy expenditure, and mortality of wildlife species. Limiting the duration of human disturbance and avoiding important seasonal habitats prove more beneficial for wildlife than a long-term chtonic disturbance.

Continuous salvage harvesting would eliminate recruitment of snags and downed woody material. Under current management, snags and downed material are allowed to build up over several years. When harvests are proposed, snags, snag recuits, and downed material are left in place. These materials provide important forest structure for a host of wildlife species. Continuous removal of this material would limit recruitment of important wildlife habitat features.

# APPENDIX A

## (RESPONSE TO COMMENT B-18)

# TIMBER DATA DICTIONARY TO ACCOMPANY THE DATABASE TABLES:

**TAGID/STAND NUMB**: TAGID, 10 COLUMNS, CHARACTER

This class is a combination of several fields, TWN + RNG + SEC + ST_ID. It indicates the unique code for each area. Those nonstate owned areas that are totally surrounded by State ownership may have a stand id code of 00 or 0A.

**POLY AREA**: POLYGON ACREAGE, NUMERIC

This field indicates the acreage of the polygon. It includes all acreage within the polygon, including road clearings and SMZ areas.

**TYPE:** LAND USE OR COVER TYPE CODES, 2 COLUMNS

Commercial Timberland Cover Type Codes.

| Code | Species | Code | Species |
|---|---|---|---|
| AF | SUBALPINE FIR | PF | LIMBER PINE |
| BP | BULL PINE | _S | SPRUCE SPECIES |
| _C | WESTERN CEDAR | WB | WHITEBARK PINE |
| _D | DOUGLAS-FIR | WH | WESTERN HEMLOCK |
| DL | DOUGLAS-FIR/LARCH | WP | WESTERN WHITE PINE |
| GF | GRAND FIR | YP | YELLOW PINE |
| _L | WESTERN LARCH | _A | ASPEN |
| LP | LODGEPOLE PINE | CO | COTTONWOOD SPECIES |
| MC | MIXED CONIFER | OH | WILLOW, BIRCH, AND OTHER HARDWOODS |
| MH | MOUNTAIN HEMLOCK | | |
| _P | PONDEROSA PINE | | |

Other Land Use Codes

| Code | Land Type | Code | Land Type |
|---|---|---|---|
| NC | NONCOMMERCIAL FOREST LAND | _W | WATER |
| NF | NONFOREST LAND | R_ | ROADS |

**SSC:** STAND SIZE CLASS, 1 COLUMN

| Code | Definition |
|---|---|
| 6 | Nonstocked and deforested stands |
| 7 | Seedling and sapling stands |
| 8 | Poletimber stands |
| 9 | Sawtimber stands |

**STKING:** STOCKING CLASS, 2 COLUMNS

The first column is for the whole stand. The second column is for the sawtimber component.

| Code | Stocking |
|---|---|
| N | Nonstocked ( 0-9% crown density, poletimber stands only) |
| P | Poorly stocked (10-39% crown density) |
| M | Mediun stocked (40-69% crown density) |
| W | Well stocked (70+ % crown density) |

Seedling and Sapling Stand Stocking Codes and Definitions.

| Stocking Code | Class | Established to 0.99" d.b.h. | 1.0" to 2.99" d.b.h. | 3.00" to 4.99" d.b.h. |
|---|---|---|---|---|
| | | Trees per Acre | | |
| N | Nonstocked | 0 - 100 | 0 - 50 | 0 - 50 |
| P | Poor | 100 - 999 | 50 - 499 | 50 - 249 |
| M | Medium | 1000 - 1999 | 500 -1499 | 250 - 999 |
| W | Well | 2000+ | 1500+ | 1000+ |

**MFT3:** THOUSAND CUBIC FEET, 2 COLUMNS

| Code | Definition |
|---|---|
| 3 | 3,000 ft3 |
| 11 | 11,000 ft3 |

**MBFS:** THOUSAND NET BOARD FEET SCRIBNER, 2 COLUMNS

| Code | Definition |
|---|---|
| 4 | 4,000 net board feet Scribner |
| 26 | 26,000 net board feet Scribner |

**AVGHT:** AVERAGE STAND HEIGHT, 3 COLUMNS

Example:

| Code | Average Height |
|---|---|
| 50 | 50 feet |
| 120 | 120 feet |

**BFBA:** BOARD FOOT BASAL AREA PER ACRE, 2 COLUMNS

Example:

| Code | Board Foot Basal Area ($ft^2$/acre) |
|---|---|
| 2 | 20 |
| 18 | 180 |

**FT3BA:** CUBIC FOOT BASAL AREA PER ACRE, 2 COLUMNS

Example:

| Code | Cubic Foot Basal Area ($ft^3$/acre) |
|---|---|
| 3 | 30 |
| 12 | 120 |

**DBH:** AVERAGE STAND DIAMETER, 2 COLUMNS
Average stand diameter in inches.

## SAWTIMBER STAND DATA

The following data shall be recorded for sawtimber stands (stand size class = 9) only.

**ULSTK**: UPPER CANOPY LEVEL STOCKING, CHARACTER, 1 COLUMN
**MLSTK**: MIDDLE CANOPY LEVEL STOCKING, CHARACTER, 1 COLUMN
**LLSTK:** LOWER CANOPY LEVEL STOCKING, CHARACTER, 1 COLUMN

**Canopy Level Stocking**: Crown density for each canopy level or story in the stand. For example, a two-storied stand will have stocking data recorded for the upper canopy (ULSTK) and the lower canopy (LLSTK) levels. Single storied stands will only have the upper level stocking data recorded. Classic uneven-aged structured and multi-storied stands will have data recorded in all of the canopy level stocking fields using the following procedure.

| Code | Definition |
|---|---|
| S | Scattered tree stocking, crown density < 15% |
| P | Poorly stocked, crown density 15 - 39% |
| M | Medium stocking, crown density 40 - 69% |
| W | Well stocked, crown density >= 70% |

**Species Composition**: The four most dominate tree species in each canopy level of the stand. Also, an estimate of the portion of total stocking in percent, each species comprises within a canopy level.

ULSPEC: UPPER CANOPY LEVEL'S FOUR MOST DOMINATE SPECIES, CHARACTER, 12 COLUMNS
MLSPEC: MIDDLE CANOPY LEVEL'S FOUR MOST DOMINATE SPECIES, CHARACTER, 12 COLUMNS
LLSPEC: LOWER CANOPY LEVEL'S FOUR MOST DOMINATE SPECIES, CHARACTER, 12 COLUMNS

| Code | Definition |
|---|---|
| LP6/_L2/AF1/___ | Lodgepole pine, 60 - 69% of total stocking in canopy level<br>Western larch, 20 - 29% of total stocking in canopy level<br>Subalpine fir, 10 - 19% of total stocking in canopy level |

**Vigor Class**: The code that indicates the vigor of each canopy level in the stand.

ULVIGOR: UPPER LEVEL CANOPY VIGOR CLASS, CHARACTER, 1 COLUMN
MLVIGOR: MIDDLE LEVEL CANOPY VIGOR CLASS, CHARACTER, 1 COLUMN
LLVIGOR: LOWER LEVEL CANOPY VIGOR CLASS, CHARACTER, 1 COLUMN

| Code | Definition |
|---|---|
| 1 | Full vigor: open grown trees, crown closure has not yet occurred. |
| 2 | Good to average vigor: crowns closed, at least in clumps, but growth has not yet slowed greatly, crown lengths > 50% in young stands (< 40 years old), crown lengths > 33% in older stands. |
| 3 | Just below average to poor vigor: poor crown ratios and growth. |
| 4 | Very poor vigor: stand is generally in a decadent condition (dead and or broken tops are quite common, very poor crown ratios, thin or unhealthy foliage, rounded crowns, etc) due to insect and disease problems, stagnation, suppression, or old age. |

**Average Height**: The average height of each canopy level in feet.

ULHT: UPPER LEVEL CANOPY AVERAGE HEIGHT, NUMERIC
MLHT: MIDDLE LEVEL CANOPY AVERAGE HEIGHT, NUMERIC
LLHT: LOWER LEVEL CANOPY AVERAGE HEIGHT, NUMERIC

**Average DBH**: The average dbh of each canopy level in inches.

ULDBH: UPPER LEVEL CANOPY AVERAGE DBH, NUMERIC
MLDBH: MIDDLE LEVEL CANOPY AVERAGE DBH, NUMERIC
LLDBH: LOWER LEVEL CANOPY AVERAGE DBH, NUMERIC

**Average Age**: The average age of each canopy level

ULAGE: UPPER LEVEL CANOPY AVERAGE AGE, NUMERIC
MLAGE: MIDDLE LEVEL CANOPY AVERAGE AGE, NUMERIC
LLAGE: LOWER LEVEL CANOPY AVERAGE AGE, NUMERIC

# *Alt B mbfs*

| UNIT_NUMB | TREATMENT | COVERTYPE | POLY_AREA | STAND_NUMB | TYPE | SSC | STKING | MFTS | MBFS | AVGHT | BFBA | FT3BA | DBH | ULSTK | ULSPEC | ULDBH | ULAGE | MLSTK | MLSPEC | MLHT | MLDBH | MLAGE | LLSTK | LLSPEC | LLHT | LLDBH | LLAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CCR | LP | 128.096 | 34213502 | LP | 6 | WL | 3 | 4 | 60 | 7 | 14 | 6 | | | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 1 | CCR | LP | 12.676 | 34213613 | LP | 6 | WM | 4 | 11 | 70 | 6 | 12 | 12 | M | LP9 | 12 | 80 | P | S6AF4<br>D0 | 46 | 7 | 60 | M | S4AF4L<br>P1WP0 | 6 | 1 | 30 |
| 1 | CCR | LP | 0.222 | 34213503 | LP | 7 | W | 0 | 0 | 30 | 0 | 1 | 4 | W | LP9 | 4 | 25 | | | 0 | 0 | 0 | L | LP4<br>S3AF2 | 4 | 0 | 10 |
| 1 | CCR | LP | 16.793 | 34213612 | LP | 6 | W | 2 | 0 | 60 | 0 | 6 | 7 | W | LP6 | 7 | 60 | | | 0 | 0 | 0 | M | AF4<br>S4LP1 | 6 | 1 | 30 |
| 1 | CCR | ALP/NC | 2.891 | 34213505 | DL | 6 | WL | 4 | 6 | 70 | 6 | 14 | 14 | | | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 3 | CCR/SH | MC | 27.799 | 34213309 | DL | 6 | WL | 5 | 16 | 100 | 10 | 14 | 22 | L | L4 S3<br>D2AF1 | 27 | 200 | L | AF5 S3<br>L1LP0 | 60 | 14 | 130 | L | AF6 S4 | 36 | 4 | 60 |
| 4 | CCR/SH | MC | 41.566 | 34213309 | DL | 6 | WL | 5 | 16 | 100 | 10 | 14 | 22 | L | L4 S3<br>D2AF1 | 27 | 200 | L | AF5 S3<br>L1LP0 | 60 | 14 | 130 | L | AF6 S4 | 26 | 4 | 60 |
| 6 | STR | ALP/NC | 37.14 | 34213505 | DL | 6 | WL | 4 | 6 | 70 | 6 | 14 | 14 | | | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 6 | STR | LP | 1.567 | 34213501 | LP | 7 | W | 0 | 0 | 30 | 0 | 0 | 4 | | | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 5 | STR | LP | 2.002 | 34213501 | LP | 7 | W | 0 | 0 | 30 | 0 | 0 | 4 | | | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 6 | STR | LP | 0.222 | 34213501 | LP | 7 | W | 0 | 0 | 30 | 0 | 0 | 4 | | | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 6 | CCR/SH | ALP/NC | 1.112 | 34213108 | DL | 5 | WL | 4 | 12 | 100 | 6 | 12 | 24 | L | L3 D3<br>S3WP1 | 26 | 200 | L | AF6<br>S3LP0 | 70 | 13 | 130 | L | AF7 S3 | 30 | 3 | 60 |
| 7 | CCR/SH | MC | 0.222 | 34213204 | DL | 5 | WM | 5 | 15 | 100 | 10 | 14 | 22 | L | L5 S2<br>D2AF1 | 26 | 200 | L | AF6 S3<br>D1 | 70 | 13 | 130 | L | AF6 S3<br>D1 | 15 | 3 | 40 |
| 7 | CCR/SH | MC | 3.558 | 34213204 | DL | 5 | WM | 5 | 15 | 100 | 10 | 14 | 22 | L | L5 S3<br>D2AF1 | 36 | 200 | L | AF6 S3<br>D1 | 70 | 13 | 130 | L | AF6 S3<br>D1 | 15 | 3 | 40 |
| 8 | CCR/SH | MC | 58.274 | 34213009 | L | 9 | WM | 6 | 23 | 130 | 10 | 14 | 26 | L | L4<br>S3WP2 | 30 | 200 | L | AF6 S4 | 60 | 14 | 120 | L | AF6 S3<br>D0 | 25 | 4 | 50 |
| 7 | CCR/SH | MC | 0.667 | 34213204 | DL | 6 | WM | 5 | 16 | 100 | 10 | 14 | 22 | L | L5 S2<br>D2AF1 | 26 | 200 | L | AF6 S3<br>D1 | 70 | 13 | 130 | L | AF6 S3<br>D1 | 15 | 3 | 40 |
| 7 | CCR/SH | MC | 17.586 | 34212806 | DL | 6 | WM | 7 | 36 | 130 | 16 | 17 | 30 | L | L5 S3<br>D1WP0 | 24 | 200 | L | AF6 S3 | 70 | 13 | 80 | P | AF6 S3 | 35 | 4 | 40 |
| 8 | CCR/SH | MC | 7.764 | 34212912 | L | 9 | MP | 3 | 14 | 120 | 6 | 7 | 26 | P | L7<br>S2AF1 | 26 | 200 | P | AF7 S3 | 60 | 12 | 130 | P | AF7 S3 | 16 | 3 | 60 |
| 5 | CCR/SH | MC | 22.907 | 34212805 | L | 8 | ML | 4 | 16 | 100 | 10 | 12 | 26 | L | L4 S4<br>D1AF1 | 30 | 200 | L | AF6 S4 | 75 | 12 | 160 | L | AF6 S4 | 12 | 2 | 30 |
| 5 | STR | ALP/NC | 4.67 | 34212805 | L | 5 | WL | 4 | 7 | 100 | 4 | 10 | 30 | L | L6 D1 | 22 | 150 | W | LP4<br>L4AF1 D0 | 70 | 6 | 60 | M | LP4AF2<br>L2 D1 | 26 | 3 | 30 |
| 5 | STR | LP | 15.76 | 34212601 | LP | 6 | W | 1 | 0 | 60 | 0 | 6 | 6 | S | L6 D0 | 30 | 150 | W | LP6 L1 | 50 | 5 | 60 | M | AF6 S3 | 10 | 2 | 30 |
| 10 | CCR/STR | WL/DF | 36.475 | 34212722 | DL | 6 | WW | 4 | 13 | 80 | 10 | 14 | 30 | W | D4<br>L4AF2 | 30 | 200 | M | D6AF3LP<br>1 L0 | 60 | 7 | 80 | L | D6AF5 | 12 | 2 | 30 |
| 5 | STR | ALP/NC | 0.446 | 34213605 | L | 5 | WL | 4 | 7 | 100 | 4 | 10 | 30 | L | L6 D1 | 22 | 150 | W | LP4<br>L4AF1 D0 | 70 | 6 | 60 | M | LP4AF2<br>L2 D1 | 35 | 3 | 30 |
| 8 | CCR/SH | WL/DF | 0.222 | 34213013 | L | 6 | MP | 0 | 2 | 130 | 1 | 1 | 26 | S | L7 D3 | 25 | 200 | | | 0 | 0 | 0 | M | L4AF3<br>D2 S1 | 3 | 0 | 10 |

| UNIT_NUMB | TREATMENT | COVERTYPE | POLY_AREA | STAND_NUMB | TYPE | SSC | STKING | MFT3 | MBFS | AVGHT | BFBA | FT3BA | DBH | ULSTK | ULSPEC | ULDBH | ULAGE | MLSTK | MLSPEC | MLHT | MLDBH | MLAGE | LLSTK | LLSPEC | LLHT | LLDBH | LLAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | STR/SH | ALP/NC | 20.905 | 34212814 | AF | 9 | WM | 6 | 13 | 90 | 11 | 14 | 14 | L | AF4 S3 D2WP1 | 15 | 150 | M | AF5 S2LP2WP | 80 | 6 | 100 | L | AF7 S2 D0WP0 | 8 | 1 | 30 |
| 12 | CCR/SH | MC | 10.23 | 34213009 | L | 9 | WM | 9 | 23 | 120 | 10 | 14 | 28 | L | L4 S3WP2 | 30 | 200 | L | AF6 S4 | 80 | 14 | 120 | L | AF6 S3 D0 | 25 | 4 | 50 |
| 13 | STR/SH | ALP/NC | 4.67 | 34212310 | DL | 9 | WM | 4 | 10 | 70 | 10 | 14 | 12 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 13 | STR/SH | DF | 110.752 | 34212306 | D | 9 | WW | 4 | 14 | 95 | 11 | 13 | 18 | L | D9LP0 | 22 | 150 | M | D6LP0AF 0 S0 | 70 | 18 | 120 | M | D6LP1A F0 S0 | 25 | 4 | 40 |
| 13 | STR/SH | WWP | 8.673 | 34212308 | D | 9 | WP | 2 | 2 | 60 | 4 | 8 | 6 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 13 | STR/SH | ALP/NC | 8.008 | 34212309 | AF | 9 | MP | 2 | 3 | 60 | 5 | 8 | 9 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 13 | STR/SH | ALP/NC | 1.557 | 34212307 | AF | 9 | WM | 4 | 8 | 55 | 12 | 19 | 8 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 13 | STR/SH | WL/DF | 14.233 | 34212214 | D | 9 | WW | 5 | 23 | 95 | 15 | 19 | 18 | L | D9 | 28 | 200 | M | D6LP2 L1 | 95 | 18 | 140 | P | D7LP2 | 30 | 5 | 50 |
| 13 | STR/SH | ALP/NC | 0.222 | 34212307 | AF | 8 | WM | 4 | 9 | 65 | 12 | 16 | 9 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 13 | STR/SH | ALP/NC | 1.334 | 34212203 | AF | 9 | WW | 4 | 12 | 95 | 10 | 12 | 18 | W | AF5LP2 S2 D0 | 19 | 140 | L | AF6 S2LP1 | 40 | 5 | 80 | M | AF5 S3LP1W | 6 | 1 | 20 |
| 13 | STR/SH | DF | 36.361 | 34211503 | D | 9 | WW | 5 | 22 | 95 | 14 | 15 | 20 | L | D9 | 28 | 200 | M | D6LP2AF 1 L0 | 90 | 18 | 140 | P | D6LP2A F1 S0 | 30 | 6 | 50 |
| 13 | STR/SH | DF | 59.895 | 34211502 | D | 9 | WM | 4 | 18 | 90 | 11 | 13 | 18 | L | D9 | 28 | 200 | M | D6LP1AF 0 S0 | 75 | 18 | 140 | M | D7LP2A F0 S0 | 25 | 4 | 40 |
| 13 | STR/SH | ALP/NC | 10.008 | 34211404 | AF | 6 | MP | 2 | 2 | 60 | 4 | 8 | 8 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 14 | CCR/SH | ALP/NC | 97.199 | 34211407 | DL | 8 | WW | 9 | 26 | 100 | 16 | 17 | 20 | L | L5 S2 D2 | 28 | 200 | M | L3AF3 S2LP1 | 90 | 18 | 120 | L | AF5 S4LP0 | 20 | 4 | 50 |
| 13 | STR/SH | DF | 0.222 | 34211503 | D | 9 | WW | 6 | 22 | 95 | 14 | 15 | 20 | L | D9 | 28 | 200 | M | D6LP2AF 1 L0 | 90 | 18 | 140 | P | D6LP2A F1 S0 | 30 | 6 | 50 |
| 14 | CCR/SH | MC | 32.914 | 34211405 | L | 8 | WW | 9 | 27 | 110 | 13 | 16 | 20 | P | L7 D1 S1AF0 | 28 | 200 | W | AF4 S3 D1 L1 | 90 | 18 | 120 | L | AF3 S3 D2 L1 | 15 | 2 | 30 |
| 14 | CCR/SH | MC | 86.066 | 34211406 | DL | 8 | WW | 7 | 33 | 110 | 15 | 19 | 22 | M | L6 S2 D1 | 28 | 150 | M | S9 L2LP1 D0 | 95 | 18 | 120 | P | AF4 S4LP1 | 20 | 4 | 40 |

# Alt C mbfs

| UNIT_NUMB | TREATMENT | COVER_TYPE | POLY_AREA | STAND_NUMB | TYPE | SIC | STKING | MFTS | MBFS | AVGHT | BFBA | FTSBA | DBH | ULSTK | ULSPEC | ULDBH | ULAGE | MLSTK | MLSPEC | MLHT | MLDBH | MLAGE | LLSTK | LLSPEC | LLHT | LLDBH | LLAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | CCR | LP | 128.098 | 34213602 | LP | 6 | WL | 3 | 4 | 50 | 7 | 14 | 6 | | | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 7 | CCR | LP | 12.676 | 34213613 | LP | 8 | WM | 4 | 11 | 76 | 8 | 12 | 12 | M | LP9 | 12 | 80 | P | S6AF4 D0 | 45 | 7 | 50 | M | S4AF4LP 1WP0 | 5 | 1 | 20 |
| 7 | CCR | LP | 0.222 | 34213603 | LP | 7 | W | 0 | 0 | 30 | 0 | 1 | 4 | W | LP9 | 4 | 25 | | | 0 | 0 | 0 | L | LP4 S3AF2 | 4 | 0 | 10 |
| 6 | TFB/STR | WWP | 41.588 | 34213106 | S | 6 | ML | 3 | 10 | 100 | 8 | 10 | 28 | L | S4 D3WP2 | 28 | 200 | L | AF7 S3 | 70 | 13 | 120 | L | AF6 S4 D0 | 25 | 6 | 50 |
| 7 | CCR | LP | 18.793 | 34213612 | LP | 8 | W | 2 | 0 | 60 | 0 | 8 | 7 | W | LP9 | 7 | 80 | | | 0 | 0 | 0 | M | AF4 S4LP1 D0 | 6 | 1 | 20 |
| 6 | TFB/STR | MC | 41.61 | 34213204 | DL | 6 | WM | 6 | 16 | 100 | 10 | 14 | 22 | L | L5 S3 D2AF1 | 28 | 200 | L | AF6 S3 D1 | 70 | 13 | 120 | L | AF6 S3 D1 | 16 | 3 | 40 |
| 7 | CCR | ALP/NC | 2.891 | 34213606 | DL | 8 | WL | 4 | 6 | 70 | 8 | 14 | 14 | | | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 6 | TFB/STR | WL/DF | 13.344 | 34213102 | DL | 8 | WM | 6 | 14 | 90 | 10 | 14 | 18 | L | L5 D3 S1AF1 | 22 | 200 | L | AF6 D2LP2 | 70 | 13 | 100 | L | AF7 D3 | 30 | 8 | 50 |
| 6 | TFB/STR | MC | 80.039 | 34213204 | DL | 6 | WM | 6 | 16 | 100 | 10 | 14 | 22 | L | L5 S2 D2AF1 | 28 | 200 | L | AF6 S3 D1 | 70 | 13 | 120 | L | AF6 S3 D1 | 16 | 3 | 40 |
| 6 | TFB/STR | MC | 27.799 | 34213309 | DL | 8 | WL | 6 | 16 | 100 | 10 | 14 | 22 | L | L4 S3 D2AF1 | 27 | 200 | L | AF6 S3 L1LP0 | 80 | 14 | 120 | L | AF6 S4 | 25 | 4 | 50 |
| 6 | TFB/STR | MC | 41.588 | 34213309 | DL | 8 | WL | 6 | 16 | 100 | 10 | 14 | 22 | L | L4 S3 D2AF1 | 27 | 200 | L | AF5 S3 L1LP0 | 80 | 14 | 130 | L | AF6 S4 | 25 | 4 | 50 |
| 6 | TFB/STR | ALP/NC | 24.019 | 34213104 | DL | 8 | ML | 3 | 10 | 90 | 8 | 10 | 20 | L | D3 L3 S3AF1 | 22 | 200 | L | AF6 S3 D1 | 75 | 14 | 160 | P | AF6 S3 D1 | 6 | 1 | 30 |
| 6 | TFB/STR | ALP/NC | 6.113 | 34213109 | S | 8 | ML | 3 | 12 | 100 | 8 | 10 | 26 | L | S6 L2 D2WP1 | 28 | 200 | L | AF6 S3 | 80 | 14 | 130 | P | AF5 S4 | 10 | 2 | 30 |
| 6 | TFB/STR | ALP/NC | 10.23 | 34213108 | DL | 9 | WL | 4 | 12 | 100 | 8 | 12 | 24 | L | L3 D3 S3WP1 | 28 | 200 | L | AF6 S3LP0 | 70 | 13 | 120 | L | AF7 S3 | 20 | 3 | 50 |
| 8 | STR | ALP/NC | 37.14 | 34213606 | DL | 9 | WL | 4 | 8 | 70 | 8 | 14 | 14 | | | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 6 | STR | LP | 1.567 | 34213601 | LP | 7 | W | 0 | 0 | 30 | 0 | 0 | 4 | | | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 6 | STR | LP | 2.002 | 34213601 | LP | 7 | W | 0 | 0 | 30 | 0 | 0 | 4 | | | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 6 | TFB/STR | ALP/NC | 0.222 | 34213104 | DL | 6 | ML | 3 | 10 | 90 | 8 | 10 | 20 | L | D3 L3 S3AF1 | 22 | 200 | L | AF6 S3 D1 | 76 | 14 | 160 | P | AF6 S3 D1 | 6 | 1 | 30 |
| 6 | TFB/STR | ALP/NC | 1.112 | 34213108 | DL | 6 | WL | 4 | 12 | 100 | 8 | 12 | 24 | L | L3 D3 S3WP1 | 28 | 200 | L | AF6 S3LP0 | 70 | 13 | 120 | L | AF7 S3 | 20 | 3 | 50 |
| 6 | TFB/STR | MC | 3.588 | 34213204 | DL | 9 | WM | 6 | 15 | 100 | 10 | 14 | 22 | L | L5 S2 D2AF1 | 28 | 200 | L | AF6 S3 D1 | 70 | 13 | 120 | L | AF6 S3 D1 | 15 | 3 | 40 |
| 6 | TFB/STR | MC | 88.274 | 34213009 | L | 6 | WM | 8 | 23 | 120 | 10 | 14 | 28 | L | L4 S3WP2 | 30 | 200 | L | AF6 S4 | 80 | 14 | 120 | L | AF6 S3 D0 | 25 | 4 | 50 |
| 6 | TFB/STR | MC | 103.191 | 34213009 | L | 9 | WM | 8 | 23 | 120 | 10 | 14 | 28 | L | L4 S3WP2 | 30 | 200 | L | AF6 S4 | 80 | 14 | 120 | L | AF6 S3 D0 | 25 | 4 | 50 |
| 6 | TFB/STR | MC | 0.222 | 34213204 | DL | 8 | WM | 6 | 15 | 100 | 10 | 14 | 22 | L | L5 S2 D2AF1 | 28 | 200 | L | AF6 S3 D1 | 70 | 13 | 120 | L | AF6 S3 D1 | 15 | 3 | 40 |
| 6 | TFB/STR | MC | 2.891 | 34212909 | DL | 8 | WM | 7 | 30 | 120 | 16 | 17 | 20 | L | L5 S3 D1WP0 | 24 | 200 | L | AF6 S3 | 70 | 13 | 80 | P | AF6 S3 | 25 | 4 | 40 |

| UNIT_NUMB | TREATMENT | COVER_TYPE | POLY_AREA | STAND_NUMB | TYPE | SSC | STKING | MFTS | MBFS | AVGHT | BFBA | FT3BA | DBH | ULSTK | ULSPEC | ULDBH | ULAGE | MLSTK | MLSPEC | MLHT | MLDBH | MLAGE | LLSTK | LLSPEC | LLHT | LLDBH | LLAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | TFB/STR | MC | 17.569 | 34212909 | DL | 9 | WM | 7 | 56 | 120 | 18 | 17 | 20 | L | L5 S3<br>D1WP0 | 24 | 200 | L | AF6 S3 | 70 | 13 | 80 | P | AF6 S3 | 25 | 4 | 40 |
| 6 | TFB/STR | MC | 7.784 | 34212912 | L | 9 | MP | 3 | 14 | 120 | 9 | 7 | 28 | P | L7<br>S2AF1 | 28 | 200 | P | AF7 S3 | 60 | 12 | 120 | P | AF7 S3 | 15 | 3 | 50 |
| 6 | TFB/STR | MC | 0.667 | 34212912 | L | 9 | MP | 3 | 14 | 120 | 9 | 7 | 28 | P | L7<br>S2AF1 | 28 | 200 | P | AF7 S3 | 60 | 12 | 120 | P | AF7 S3 | 13 | 3 | 50 |
| 6 | TFB/STR | MC | 1.334 | 34212912 | L | 9 | MP | 3 | 14 | 120 | 9 | 7 | 28 | P | L7<br>S2AF1 | 28 | 200 | P | AF7 S3 | 60 | 12 | 120 | P | AF7 S3 | 15 | 3 | 60 |
| 5 | TFB/STR | MC | 0.222 | 34213309 | DL | 9 | WL | 5 | 15 | 100 | 10 | 14 | 22 | L | L4 S3<br>D2AF1 | 27 | 200 | L | AF5 S3<br>L1LP0 | 80 | 14 | 120 | L | AF6 S4 | 25 | 4 | 60 |
| 6 | TFB/STR | MC | 0.667 | 34212805 | L | 9 | ML | 4 | 15 | 100 | 10 | 12 | 28 | L | L4 S4<br>D1AF1 | 30 | 200 | L | AF6 S4 | 75 | 12 | 160 | L | AF6 S4 | 12 | 2 | 30 |
| 6 | TFB/STR | MC | 22.907 | 34212805 | L | 9 | ML | 4 | 15 | 100 | 10 | 12 | 28 | L | L4 S4<br>D1AF1 | 30 | 200 | L | AF6 S4 | 75 | 12 | 150 | L | AF6 S4 | 12 | 2 | 30 |
| 6 | TFB/STR | MC | 0.222 | 34213009 | L | 9 | WM | 8 | 23 | 120 | 10 | 14 | 28 | L | L4<br>S3WP2 | 30 | 200 | L | AF6 S4 | 80 | 14 | 120 | L | AF6 S3<br>D0 | 25 | 4 | 50 |
| 9 | STR | ALP/NC | 4.67 | 34212805 | L | 9 | WL | 4 | 7 | 100 | 4 | 10 | 20 | L | L8 D1 | 22 | 150 | W | LP4<br>L4AF1 D0 | 70 | 8 | 80 | M | LP4AF2<br>L2 D1 | 25 | 3 | 30 |
| 6 | STR | LP | 15.79 | 34212801 | LP | 9 | W | 1 | 0 | 60 | 0 | 8 | 6 | 8 | L8 D0 | 20 | 150 | W | LP8 L1 | 60 | 6 | 80 | M | AF6 S3 | 10 | 2 | 20 |
| 3 | CCR/STR | WL/DF | 36.473 | 34212722 | DL | 9 | WW | 4 | 13 | 80 | 10 | 14 | 20 | W | D4<br>L4AF2 | 20 | 200 | M | D5AF3LP<br>1 L0 | 60 | 7 | 60 | L | D5AF5 | 12 | 2 | 20 |
| 6 | TFB/STR | MC | 0.222 | 34213009 | L | 9 | WM | 9 | 23 | 120 | 10 | 14 | 28 | L | L4<br>S3WP2 | 30 | 200 | L | AF6 S4 | 60 | 14 | 120 | L | AF6 S3<br>D0 | 25 | 4 | 50 |
| 9 | STR | ALP/NC | 0.446 | 34212805 | L | 9 | WL | 4 | 7 | 100 | 4 | 10 | 20 | L | L8 D1 | 22 | 150 | W | LP4<br>L4AF1 D0 | 70 | 8 | 60 | M | LP4AF2<br>L2 D1 | 25 | 3 | 30 |
| 6 | TFB/STR | MC | 0.222 | 34213009 | L | 9 | WM | 9 | 25 | 120 | 10 | 14 | 28 | L | L4<br>S3WP2 | 30 | 200 | L | AF6 S4 | 80 | 14 | 120 | L | AF6 S3<br>D0 | 25 | 4 | 50 |
| 4 | STR/SH | ALP/NC | 20.905 | 34212814 | AF | 9 | WM | 5 | 13 | 80 | 11 | 14 | 14 | L | AF4 S3<br>D2WP1 | 15 | 150 | M | AF5<br>S2LP2WP | 60 | 9 | 100 | L | AF7 S2<br>D0WP0 | 6 | 1 | 30 |
| 6 | TFB/STR | MC | 10.23 | 34213009 | L | 9 | WM | 9 | 23 | 120 | 10 | 14 | 28 | L | L4<br>S3WP2 | 30 | 200 | L | AF6 S4 | 80 | 14 | 120 | L | AF6 S3<br>D0 | 25 | 4 | 60 |
| 1 | STR/SH | ALP/NC | 4.67 | 34212510 | DL | 9 | WM | 4 | 10 | 70 | 10 | 14 | 12 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 1 | STR/SH | DF | 110.752 | 34212306 | D | 9 | WW | 4 | 14 | 85 | 11 | 13 | 18 | L | D9LP0 | 22 | 150 | M | D6LP0AF<br>0 S0 | 70 | 18 | 120 | M | D6LP1AF<br>0 S0 | 25 | 4 | 40 |
| 1 | STR/SH | WWP | 8.673 | 34212305 | D | 9 | WP | 2 | 2 | 60 | 4 | 6 | 9 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 1 | STR/SH | ALP/NC | 8.005 | 34212306 | AF | 9 | MP | 2 | 3 | 80 | 8 | 8 | 9 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 1 | STR/SH | ALP/NC | 1.557 | 34212307 | AF | 9 | WM | 4 | 9 | 56 | 12 | 16 | 9 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 1 | STR/SH | WL/DF | 14.233 | 34212214 | D | 9 | WW | 5 | 23 | 85 | 16 | 18 | 18 | L | D9 | 28 | 200 | M | D6LP2<br>L1 | 85 | 18 | 140 | P | D7LP2 | 30 | 5 | 80 |
| 1 | STR/SH | ALP/NC | 0.222 | 34212307 | AF | 9 | WM | 4 | 6 | 56 | 12 | 16 | 9 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 1 | STR/SH | ALP/NC | 1.334 | 34212203 | AF | 9 | WW | 4 | 12 | 85 | 10 | 12 | 16 | W | AF5LP2<br>S2 D0 | 18 | 140 | L | AF6<br>S2LP1 | 40 | 5 | 60 | M | AF5<br>S3LP1WP | 3 | 1 | 20 |
| 1 | STR/SH | DF | 35.361 | 34211503 | D | 9 | WW | 8 | 22 | 85 | 14 | 15 | 20 | L | D9 | 28 | 200 | M | D6LP2AF<br>1 L0 | 80 | 18 | 140 | P | D6LP2AF<br>1 S0 | 30 | 5 | 50 |
| 1 | STR/SH | DF | 38.695 | 34211502 | D | 9 | WM | 4 | 16 | 80 | 11 | 13 | 18 | L | D9 | 28 | 200 | M | D6LP1AF<br>0 S0 | 75 | 18 | 140 | M | D7LP2AF<br>0 S0 | 25 | 4 | 40 |
| 1 | STR/SH | ALP/NC | 10.008 | 34211404 | AF | 9 | MP | 2 | 2 | 60 | 4 | 6 | 6 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |

| UNIT_NUMB | TREATMENT | COVER_TYPE | POLY_AREA | STAND_NUMB | TYPE | SSC | STKING | MFT3 | MBFS | AVGHT | BFBA | FT3BA | DBH | ULSTK | ULSPEC | ULDBH | ULAGE | MLSTK | MLSPEC | MLHT | MLDBH | MLAGE | LLSTK | LLSPEC | LLHT | LLDBH | LLAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | TFB/STR | ALP/NC | 67.186 | 34211407 | DL | 9 | WW | 6 | 28 | 100 | 15 | 17 | 20 | L | L5 S2 D2 | 28 | 200 | M | L3AF3 S2LP1 | 90 | 18 | 120 | L | AF5 S4LP0 | 20 | 4 | 50 |
| 1 | STR/SH | DF | 0.222 | 34211503 | D | 9 | WW | 6 | 22 | 96 | 14 | 15 | 20 | L | D9 | 28 | 200 | M | D6LP2AF 1 L0 | 90 | 19 | 140 | P | D6LP2AF 1 S0 | 30 | 5 | 50 |
| 2 | TFB/STR | MC | 32.914 | 34211405 | L | 9 | WW | 6 | 27 | 110 | 13 | 18 | 20 | P | L7 D1 S1AF0 | 28 | 200 | W | AF4 S3 D1 L1 | 90 | 19 | 120 | L | AF3 S3 D2 L1 | 15 | 2 | 30 |
| 2 | TFB/STR | MC | 88.068 | 34211408 | DL | 9 | WW | 7 | 33 | 110 | 19 | 19 | 22 | M | L6 S2 D1 | 28 | 150 | M | S9 | 95 | 19 | 120 | P | AF4 | 20 | 4 | 40 |

# *Alt D mbfs*

| UNIT_NUMB | TREATMENT | COVERTYPE | POLY_AREA | STAND_NUMB | TYPE | SIC | STKING | MFT3 | MBFS | AVGHT | BFBA | FT3BA | DBH | ULSTK | ULSPEC | ULDBH | ULAGE | MLSTK | MLSPEC | MLHT | MLDBH | MLAGE | LLSTK | LLSPEC | LLHT | LLDBH | LLAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CCR | LP | 126.098 | 34213602 | LP | 8 | WL | 3 | 4 | 50 | 7 | 14 | 8 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 1 | CCR | LP | 12.676 | 34213613 | LP | 5 | WM | 4 | 11 | 76 | 8 | 12 | 12 | M | LP9 | 12 | 80 | P | S6AF4<br>D0 | 45 | 7 | 80 | M | S4AF4LP<br>1WP0 | 5 | 1 | 20 |
| 1 | CCR | LP | 0.222 | 34213603 | LP | 7 | W | 0 | 0 | 30 | 0 | 1 | 4 | W | LP9 | 4 | 25 |  |  | 0 | 0 | 0 | L | LP4<br>S3AF2 | 4 | 0 | 10 |
| 1 | CCR | LP | 10.793 | 34213612 | LP | 8 | W | 2 | 0 | 60 | 0 | 8 | 7 | W | LP9 | 7 | 80 |  |  | 0 | 0 | 0 | M | AF4<br>S4LP1 D0 | 8 | 1 | 20 |
| 1 | CCR | ALP/NC | 2.891 | 34213605 | DL | 8 | WL | 4 | 8 | 70 | 8 | 14 | 14 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 9 | CCR/SH | MC | 27.799 | 34213309 | DL | 8 | WL | 5 | 15 | 100 | 10 | 14 | 22 | L | L4 S3<br>D2AF1 | 27 | 200 | L | AF5 S3<br>L1LP0 | 80 | 14 | 120 | L | AF6 S4 | 25 | 4 | 50 |
| 12 | CCR/SH | MC | 41.569 | 34213309 | DL | 8 | WL | 8 | 16 | 100 | 10 | 14 | 22 | L | L4 S3<br>D2AF1 | 27 | 200 | L | AF5 S3<br>L1LP0 | 80 | 14 | 120 | L | AF6 S4 | 25 | 4 | 50 |
| 4 | STR | ALP/NC | 37.14 | 34213605 | DL | 8 | WL | 4 | 8 | 70 | 8 | 14 | 14 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 4 | STR | LP | 1.557 | 34213601 | LP | 7 | W | 0 | 0 | 30 | 0 | 0 | 4 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 4 | STR | LP | 2.002 | 34213601 | LP | 7 | W | 0 | 0 | 30 | 0 | 0 | 4 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 4 | STR | LP | 0.222 | 34213601 | LP | 7 | W | 0 | 0 | 30 | 0 | 0 | 4 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 8 | CCR/SH | ALP/NC | 1.112 | 34213108 | DL | 8 | WL | 4 | 12 | 100 | 8 | 12 | 24 | L | L3 D9<br>S3WP1 | 28 | 200 | L | AF6<br>S3LP0 | 70 | 13 | 120 | L | AF7 S3 | 20 | 3 | 50 |
| 8 | CCR/SH | MC | 0.222 | 34213204 | DL | 5 | WM | 6 | 13 | 100 | 10 | 14 | 22 | L | L5 S2<br>D2AF1 | 28 | 200 | L | AF6 S3<br>D1 | 70 | 13 | 120 | L | AF6 S3<br>D1 | 15 | 3 | 40 |
| 8 | CCR/SH | MC | 3.559 | 34213204 | DL | 8 | WM | 5 | 16 | 100 | 10 | 14 | 22 | L | L5 S2<br>D2AF1 | 28 | 200 | L | AF6 S3<br>D1 | 70 | 13 | 120 | L | AF6 S3<br>D1 | 13 | 3 | 40 |
| 5 | CCR/SH | MC | 66.274 | 34213009 | L | 8 | WM | 5 | 23 | 120 | 10 | 14 | 28 | L | L4<br>S3WP2 | 30 | 200 | L | AF6 S4 | 80 | 14 | 120 | L | AF6 S3<br>D0 | 25 | 4 | 50 |
| 8 | CCR/SH | MC | 0.667 | 34213204 | DL | 8 | WM | 6 | 13 | 100 | 10 | 14 | 22 | L | L5 S2<br>D2AF1 | 28 | 200 | L | AF6 S3<br>D1 | 70 | 13 | 120 | L | AF6 S3<br>D1 | 15 | 3 | 40 |
| 8 | CCR/SH | MC | 17.569 | 34213905 | DL | 8 | WM | 7 | 38 | 120 | 16 | 17 | 20 | L | L5 S3<br>D1WP0 | 24 | 200 | L | AF6 S3 | 70 | 13 | 90 | P | AF6 S3 | 25 | 4 | 40 |
| 7 | CCR/SH | MC | 7.784 | 34212912 | L | 8 | MP | 8 | 14 | 120 | 8 | 7 | 28 | P | L7<br>S2AF1 | 28 | 200 | P | AF7 S3 | 80 | 12 | 120 | P | AF7 S3 | 15 | 3 | 50 |
| 5 | CCR/SH | MC | 22.907 | 34213805 | L | 8 | ML | 4 | 16 | 100 | 10 | 12 | 28 | L | L4 S4<br>D1AF1 | 30 | 200 | L | AF6 S4 | 75 | 12 | 160 | L | AF6 S4 | 12 | 2 | 30 |
| 4 | STR | ALP/NC | 4.67 | 34212605 | L | 8 | WL | 4 | 7 | 100 | 4 | 10 | 30 | L | L8 D1 | 22 | 150 | W | LP4<br>L4AF1 D0 | 70 | 8 | 90 | M | LP4AF2<br>L2 D1 | 25 | 3 | 30 |
| 4 | STR | LP | 15.79 | 34213601 | LP | 5 | W | 1 | 0 | 50 | 0 | 5 | 6 | S | L9 D0 | 20 | 150 | W | LP8 L1 | 50 | 5 | 80 | M | AF6 S3 | 10 | 2 | 20 |
| 5 | CCR/STR | WL/DF | 38.473 | 34212722 | DL | 5 | WW | 4 | 13 | 90 | 10 | 14 | 20 | W | D4<br>L4AF2 | 20 | 200 | M | D5AF3LP<br>1 L0 | 80 | 7 | 80 | L | D6AF5 | 12 | 2 | 20 |
| 4 | STR | ALP/NC | 0.445 | 34212605 | L | 8 | WL | 4 | 7 | 100 | 4 | 10 | 20 | L | L8 D1 | 22 | 150 | W | LP4<br>L4AF1 D0 | 70 | 6 | 80 | M | LP4AF2<br>L2 D1 | 25 | 3 | 30 |
| 6 | CCR/SH | WL/DF | 0.222 | 34213013 | L | 5 | MP | 0 | 2 | 130 | 1 | 1 | 28 | S | L7 D3 | 28 | 200 |  |  | 0 | 0 | 0 | M | L4AF3<br>D2 S1 | 3 | 0 | 10 |

| UNIT_NUMB | TREATMENT | COVERTYPE | POLY_AREA | STAND_NUMB | TYPE | SSC | STKING | MFT3 | MBFS | AVGHT | BFBA | FT3BA | DBH | ULSTK | ULSPEC | ULDBH | ULAGE | MLSTK | MLSPEC | MLHT | MLDBH | MLAGE | LLSTK | LLSPEC | LLHT | LLDBH | LLAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | STR/SH | ALP/NC | 20.905 | 34212814 | AF | 9 | WM | 5 | 13 | 90 | 11 | 14 | 14 | L | AF4 S3 D2WP1 | 15 | 150 | M | AF5 S2LP2WP | 80 | 9 | 100 | L | AF7 S2 D0WP0 | 6 | 1 | 30 |
| 10 | CCR/SH | MC | 10.23 | 34213009 | L | 9 | WM | 6 | 23 | 120 | 10 | 14 | 26 | L | L4 S3WP2 | 30 | 200 | L | AF6 S4 | 80 | 14 | 120 | L | AF6 S3 D0 | 25 | 4 | 50 |
| 13 | CCR/SH | ALP/NC | 97.186 | 34211407 | DL | 9 | WW | 6 | 26 | 100 | 15 | 17 | 20 | L | L5 S2 D2 | 26 | 200 | M | L3AF3 S2LP1 | 90 | 16 | 120 | L | AF5 S4LP0 | 20 | 4 | 50 |
| 13 | CCR/SH | MC | 32 914 | 34211405 | L | 9 | WW | 6 | 27 | 110 | 13 | 16 | 20 | P | L7 D1 S1AF0 | 26 | 200 | W | AF4 S3 D1 L1 | 90 | 16 | 120 | L | AF3 S3 D2 L1 | 15 | 2 | 30 |
| 13 | CCR/SH | MC | 88 068 | 34211406 | DL | 9 | WW | 7 | 33 | 110 | 16 | 19 | 22 | M | L6 S2 D1 | 26 | 150 | M | S6 L2LP1 D0 | 96 | 16 | 120 | P | AF4 S4LP1 L0 | 20 | 4 | 40 |

# Alt E mbfs

| UNIT_NUMB | TREATMENT | COVERTYPE | POLY_AREA | STAND_NUMB | TYPE | SSC | STKING | MFT3 | MBFS | AVGHT | BFBA | FT3BA | DBH | ULSTK | ULSPEC | ULDBH | ULAGE | MLSTK | MLSPEC | MLHT | MLDBH | MLAGE | LLSTK | LLSPEC | LLHT | LLDBH | LLAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CCR | LP | 128.098 | 34213602 | LP | 8 | WL | 3 | 4 | 50 | 7 | 14 | 8 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 1 | CCR | LP | 12.676 | 34213613 | LP | 8 | WM | 4 | 11 | 75 | 8 | 12 | 12 | M | LP9 | 12 | 80 | P | S5AF4 D0 | 45 | 7 | 50 | M | S4AF4LP 1WP0 | 5 | 1 | 20 |
| 1 | CCR | LP | 0.222 | 34213605 | LP | 7 | W | 0 | 0 | 50 | 0 | 1 | 4 | W | LP9 | 4 | 25 |  |  | 0 | 0 | 0 | L | LP4 S3AF2 | 4 | 0 | 10 |
| 2 | TFB/STR | WWP | 41.588 | 34213103 | S | 8 | ML | 3 | 10 | 100 | 8 | 10 | 26 | L | S4 D5WP2 | 26 | 200 | L | AF7 S3 | 70 | 13 | 120 | L | AF5 S4 D0 | 25 | 5 | 50 |
| 1 | CCR | LP | 19.793 | 34213612 | LP | 8 | W | 2 | 0 | 80 | 0 | 8 | 7 | W | LP9 | 7 | 80 |  |  | 0 | 0 | 0 | M | AF4 S4LP1 D0 | 8 | 1 | 20 |
| 2 | TFB/STR | MC | 41.81 | 34213204 | DL | 8 | WM | 6 | 15 | 100 | 10 | 14 | 22 | L | L5 S2 D2AF1 | 26 | 200 | L | AF6 S3 D1 | 70 | 13 | 120 | L | AF6 S3 D1 | 13 | 3 | 40 |
| 1 | CCR | ALP/NC | 2.891 | 34213606 | DL | 8 | WL | 4 | 8 | 70 | 8 | 14 | 14 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 2 | TFB/STR | WL/DF | 13.344 | 34213102 | DL | 8 | WM | 6 | 14 | 90 | 10 | 14 | 16 | L | L5 D3 S1AF1 | 22 | 200 | L | AF5 D2LP2 | 70 | 13 | 100 | L | AF7 D3 | 30 | 8 | 50 |
| 3 | TFB/STR | MC | 80.039 | 34213204 | DL | 8 | WM | 6 | 15 | 100 | 10 | 14 | 22 | L | L5 S2 D2AF1 | 26 | 200 | L | AF6 S3 D1 | 70 | 13 | 120 | L | AF6 S3 D1 | 15 | 3 | 40 |
| 4 | TFB/STR | MC | 27.799 | 34213309 | DL | 8 | WL | 6 | 16 | 100 | 10 | 14 | 22 | L | L4 S3 D2AF1 | 27 | 200 | L | AF3 S3 L1LP0 | 80 | 14 | 120 | L | AF6 S4 | 25 | 4 | 50 |
| 4 | TFB/STR | MC | 41.588 | 34213309 | DL | 8 | WL | 6 | 16 | 100 | 10 | 14 | 22 | L | L4 S3 D2AF1 | 27 | 200 | L | AF5 S3 L1LP0 | 80 | 14 | 120 | L | AF6 S4 | 25 | 4 | 50 |
| 2 | TFB/STR | ALP/NC | 24.019 | 34213104 | DL | 8 | ML | 3 | 10 | 90 | 8 | 10 | 20 | L | D3 L3 S3AF1 | 22 | 200 | L | AF6 S3 D1 | 75 | 14 | 150 | P | AF6 S3 D1 | 8 | 1 | 30 |
| 2 | TFB/STR | ALP/NC | 5.115 | 34213109 | S | 8 | ML | 3 | 12 | 100 | 8 | 10 | 26 | L | S6 L2 D2WP1 | 26 | 200 | L | AF6 S3 | 80 | 14 | 150 | P | AF5 S4 | 10 | 2 | 30 |
| 2 | TFB/STR | ALP/NC | 10.23 | 34213108 | DL | 8 | WL | 4 | 12 | 100 | 8 | 12 | 24 | L | L3 D3 S3WP1 | 26 | 200 | L | AF6 S3LP0 | 70 | 13 | 130 | L | AF7 S3 | 20 | 3 | 50 |
| 8 | STR | ALP/NC | 37.14 | 34213606 | DL | 8 | WL | 4 | 8 | 70 | 8 | 14 | 14 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 8 | STR | LP | 1.567 | 34213601 | LP | 7 | W | 0 | 0 | 50 | 0 | 0 | 4 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 8 | STR | LP | 2.002 | 34213601 | LP | 7 | W | 0 | 0 | 50 | 0 | 0 | 4 |  |  | 0 | 0 |  |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 |
| 2 | TFB/STR | ALP/NC | 0.222 | 34213104 | DL | 8 | ML | 3 | 10 | 90 | 8 | 10 | 20 | L | D3 L3 S3AF1 | 22 | 200 | L | AF6 S3 D1 | 75 | 14 | 150 | P | AF6 S3 D1 | 8 | 1 | 30 |
| 2 | TFB/STR | ALP/NC | 1.112 | 34213108 | DL | 8 | WL | 4 | 12 | 100 | 8 | 12 | 24 | L | L3 D3 S3WP1 | 26 | 200 | L | AF6 S3LP0 | 70 | 13 | 120 | L | AF7 S3 | 20 | 3 | 50 |
| 2 | TFB/STR | MC | 3.568 | 34213204 | DL | 8 | WM | 6 | 15 | 100 | 10 | 14 | 22 | L | L5 S3 D2AF1 | 26 | 200 | L | AF6 S3 D1 | 70 | 13 | 130 | L | AF6 S3 D1 | 15 | 3 | 40 |
| 2 | TFB/STR | MC | 88.274 | 34213009 | L | 8 | WM | 6 | 23 | 120 | 10 | 14 | 26 | L | L4 S3WP2 | 30 | 200 | L | AF6 S4 | 80 | 14 | 120 | L | AF6 S3 D0 | 25 | 4 | 50 |
| 2 | TFB/STR | MC | 103.191 | 34213009 | L | 8 | WM | 8 | 23 | 120 | 10 | 14 | 26 | L | L4 S3WP2 | 50 | 200 | L | AF6 S4 | 80 | 14 | 120 | L | AF6 S3 D0 | 25 | 4 | 50 |
| 2 | TFB/STR | MC | 0.222 | 34213204 | DL | 8 | WM | 6 | 15 | 100 | 10 | 14 | 22 | L | L5 S2 D2AF1 | 26 | 200 | L | AF6 S3 D1 | 70 | 13 | 120 | L | AF6 S3 D1 | 13 | 3 | 40 |
| 2 | TFB/STR | MC | 2.891 | 34212909 | DL | 8 | WM | 7 | 36 | 120 | 16 | 17 | 20 | L | L5 S3 D1WP0 | 24 | 200 | L | AF6 S3 | 70 | 13 | 80 | P | AF6 S3 | 25 | 4 | 40 |

| *UNIT_NUMB* | *TREATMENT* | *COVERTYPE* | *POLY_AREA* | *STAND_NUMB* | *TYPE* | *SSC* | *STKING* | *MFT3* | *MBFS* | *AVGHT* | *BFBA* | *FT3BA* | *DBH* | *ULSTK* | *ULSPEC* | *ULDBH* | *ULAGE* | *MLSTK* | *MLSPEC* | *MLHT* | *MLDBH* | *MLAGE* | *LLSTK* | *LLSPEC* | *LLHT* | *LLDBH* | *LLAGE* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | TFB/STR | MC | 17.569 | 34212909 | DL | 9 | WM | 7 | 36 | 120 | 16 | 17 | 20 | L | L5 S3 D1WP0 | 24 | 200 | L | AF6 S3 | 70 | 13 | 90 | P | AF6 S3 | 25 | 4 | 40 |
| 3 | TFB/STR | MC | 7.784 | 34212912 | L | 9 | MP | 3 | 14 | 120 | 6 | 7 | 26 | P | L7 S2AF1 | 28 | 200 | P | AF7 S3 | 80 | 12 | 120 | P | AF7 S3 | 15 | 3 | 50 |
| 3 | TFB/STR | MC | 0.667 | 34212912 | L | 9 | MP | 3 | 14 | 120 | 6 | 7 | 26 | P | L7 S2AF1 | 25 | 200 | P | AF7 S3 | 90 | 12 | 120 | P | AF7 S3 | 15 | 3 | 60 |
| 3 | TFB/STR | MC | 1.334 | 34212912 | L | 9 | MP | 3 | 14 | 120 | 6 | 7 | 26 | P | L7 S2AF1 | 28 | 200 | P | AF7 S3 | 90 | 12 | 120 | P | AF7 S3 | 16 | 3 | 60 |
| 4 | TFB/STR | MC | 0.222 | 34213309 | DL | 9 | WL | 6 | 15 | 100 | 10 | 14 | 22 | L | L4 S3 D2AF1 | 27 | 200 | L | AF5 S3 L1LP0 | 80 | 14 | 120 | L | AF6 S4 | 26 | 4 | 60 |
| 4 | TFB/STR | MC | 0.667 | 34212605 | L | 8 | ML | 4 | 16 | 100 | 10 | 12 | 26 | L | L4 S4 D1AF1 | 30 | 200 | L | AF6 S4 | 75 | 12 | 150 | L | AF6 S4 | 12 | 2 | 30 |
| 4 | TFB/STR | MC | 22.907 | 34212605 | L | 9 | ML | 4 | 16 | 100 | 10 | 12 | 26 | L | L4 S4 D1AF1 | 30 | 200 | L | AF6 S4 | 75 | 12 | 150 | L | AF6 S4 | 12 | 2 | 30 |
| 2 | TFB/STR | MC | 0.222 | 34213009 | L | 9 | WM | 6 | 25 | 120 | 10 | 14 | 26 | L | L4 S3WP2 | 30 | 200 | L | AF6 S4 | 80 | 14 | 120 | L | AF6 S3 D0 | 25 | 4 | 60 |
| 6 | STR | ALP/NC | 4.67 | 34212605 | L | 9 | WL | 4 | 7 | 100 | 4 | 10 | 20 | L | L8 D1 | 22 | 150 | W | LP4 L4AF1 D0 | 70 | 8 | 80 | M | LP4AF2 L2 D1 | 25 | 3 | 30 |
| 6 | STR | LP | 15.79 | 34212601 | LP | 8 | W | 1 | 0 | 50 | 0 | 6 | 5 | S | L9 D0 | 20 | 150 | W | LP6 L1 | 50 | 6 | 90 | M | AF6 S3 | 10 | 2 | 20 |
| 6 | CCR/STR | WL/DF | 36.473 | 34212722 | DL | 9 | WW | 4 | 13 | 90 | 10 | 14 | 20 | W | D4 L4AF2 | 20 | 200 | M | D6AF3LP 1 L0 | 90 | 7 | 90 | L | D6AF5 | 12 | 2 | 20 |
| 2 | TFB/STR | MC | 0.222 | 34213009 | L | 9 | WM | 6 | 25 | 120 | 10 | 14 | 26 | L | L4 S3WP2 | 30 | 200 | L | AF6 S4 | 80 | 14 | 120 | L | AF6 S3 D0 | 25 | 4 | 50 |
| 6 | STR | ALP/NC | 0.445 | 34212605 | L | 9 | WL | 4 | 7 | 100 | 4 | 10 | 20 | L | L8 D1 | 22 | 150 | W | LP4 L4AF1 D0 | 70 | 8 | 80 | M | LP4AF2 L2 D1 | 25 | 3 | 30 |
| 2 | TFB/STR | MC | 0.222 | 34213009 | L | 9 | WM | 6 | 25 | 120 | 10 | 14 | 26 | L | L4 S3WP2 | 30 | 200 | L | AF6 S4 | 80 | 14 | 120 | L | AF6 S3 D0 | 26 | 4 | 60 |
| 7 | STR/SH | ALP/NC | 20.906 | 34212814 | AF | 9 | WM | 5 | 13 | 90 | 11 | 14 | 14 | L | AF4 S3 D2WP1 | 16 | 150 | M | AF6 S2LP2WP | 80 | 6 | 100 | L | AF7 S2 D0WP0 | 6 | 1 | 30 |
| 2 | TFB/STR | MC | 10.25 | 34213009 | L | 9 | WM | 6 | 25 | 120 | 10 | 14 | 26 | L | L4 S3WP2 | 30 | 200 | L | AF6 S4 | 80 | 14 | 120 | L | AF6 S3 D0 | 25 | 4 | 60 |
| 8 | TFB/STR | ALP/NC | 97.186 | 34211407 | DL | 9 | WW | 9 | 28 | 100 | 16 | 17 | 20 | L | L6 S2 D2 | 28 | 200 | M | L3AF3 S2LP1 | 90 | 16 | 120 | L | AF6 S4LP0 | 20 | 4 | 60 |
| 8 | TFB/STR | MC | 32.914 | 34211405 | L | 9 | WW | 6 | 27 | 110 | 13 | 16 | 20 | P | L7 D1 S1AF0 | 28 | 200 | W | AF4 S3 D1 L1 | 90 | 16 | 120 | L | AF3 S3 D2 L1 | 16 | 2 | 30 |
| 8 | TFB/STR | MC | 86.066 | 34211408 | DL | 9 | WW | 7 | 33 | 110 | 19 | 19 | 23 | M | L8 S2 D1 | 28 | 150 | M | S6 L2LP1 D0 | 96 | 16 | 120 | P | AF4 S4LP1 L0 | 20 | 4 | 40 |

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